Engineering Library

In This Issue—*Another "Making Maintenance Pay" Study*

OCT 7 1922

MOTOR AGE

Vol. XLII
Number 14

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CHICAGO, OCTOBER 5, 1922

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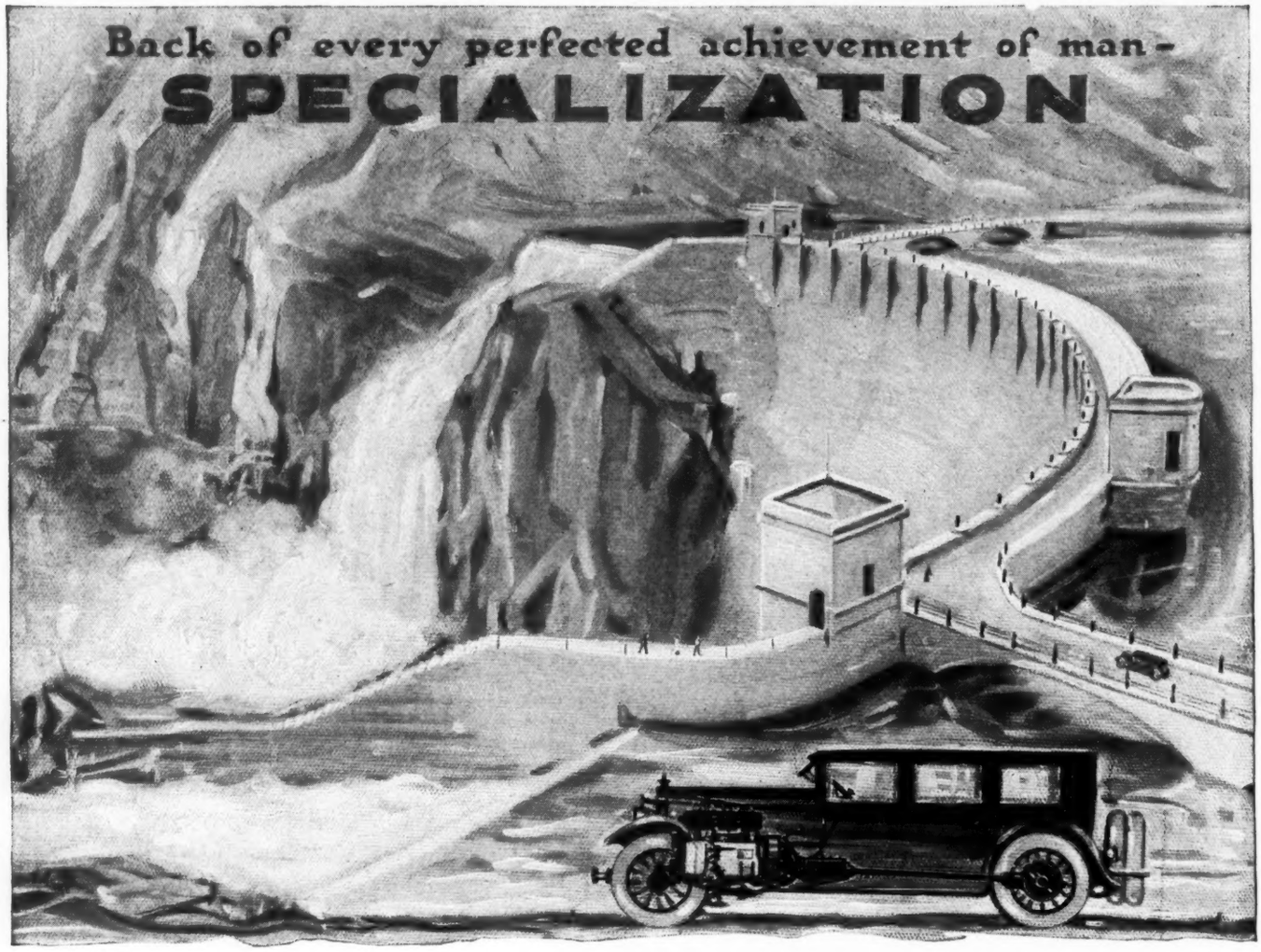

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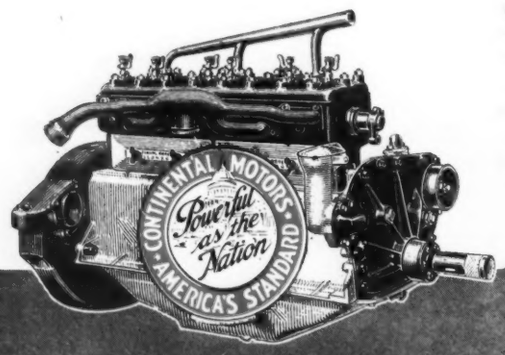
And remember the SPECIALIZED motor of the SPECIALIZED Vehicle is identified by—the Continental Red Seal.



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MOTOR AGE

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81 Motor Truck Makers Standardize on Zenith Carburetors

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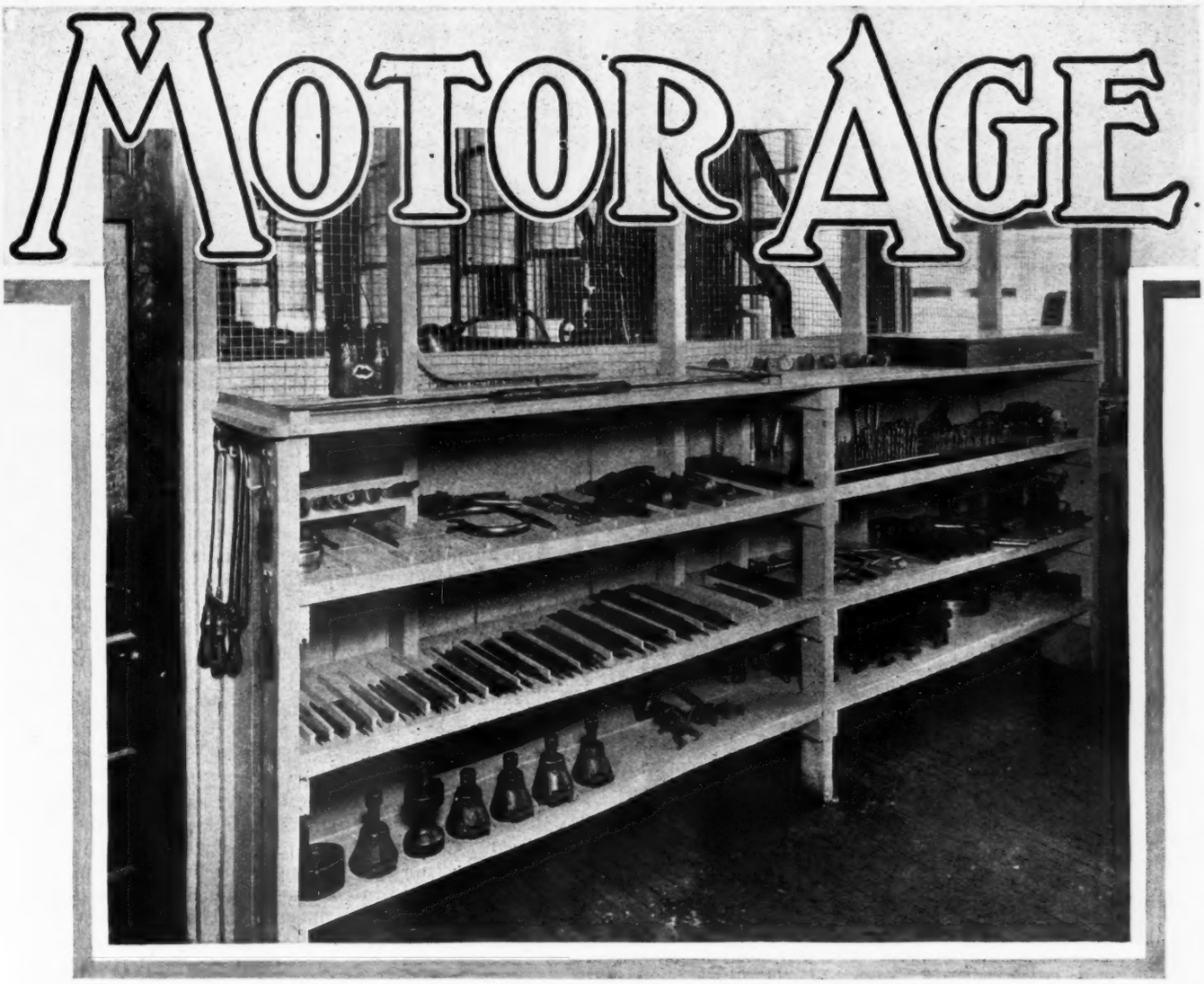


Equipment of a delicate nature is kept in a special tool room

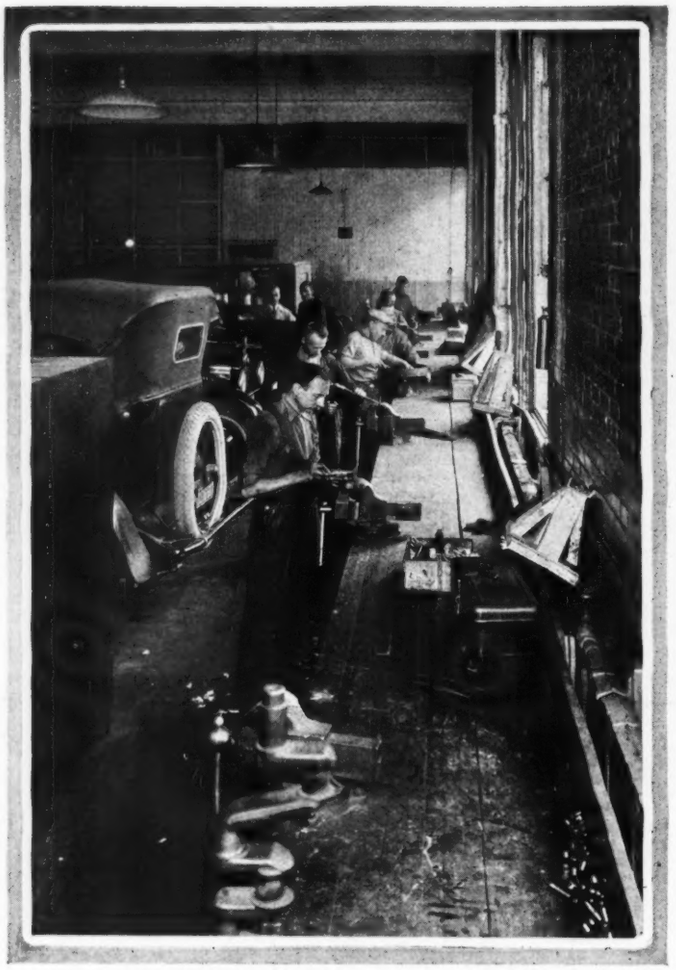
Equipment—It's Part in Making Maintenance Pay

Much "Come-Back" Work Eliminated By Insuring the Job With Well-Selected Machinery. Makes Flat Rate System Easier to Install

WHETHER or not a maintenance station shows a profit on the books at the end of a month depends almost directly on how well that shop is tooled up. Volume of work, good mechanics and system are necessary, it is true, but, a shop will get more work, be able to cope with the mechanic situation more easily and be in a position to adopt more systematic handling and selling of work when it has a good line of machine tools and other shop furniture.

Equipment not only speeds up work, does many jobs better than hand methods, conserves the energy of the men, makes the establishment of fixed prices for certain jobs possible and soon, but it also goes a long ways towards **making maintenance pay,** because it helps greatly to eliminate "come back jobs." Take an instance:

A car comes back with the owner complaining that certain plugs foul. He had new valves installed only a week ago. These had oversize stems and the mechanic



Bench at Williams & Hastings shop, 70 ft. long, made of 2 by 3 in. maple set on edge

who installed them, apparently did a good job, so far as reaming out the guides for the new stems is concerned. But he failed to use a reseating tool to make sure the new valves would seat right. He thought he had done a good job, but the job came back. The proper valve tools would have insured the job against "come-back." The shop had to make good and the cost of making good would easily have bought the necessary tool. Dozens of other cases similar to this one can be cited.

Having on hand the necessary machinery and tool equipment means that a shop can be laid out and the work so routed that the work virtually can be placed on a production basis. Certain jobs, corresponding to "sub-assemblies" in factories, can be done in the most suitable sections of the shop and then the whole brought to an "assembly line," much as the modern factory does. This puts system in the shop.

Today the better class maintenance stations are selling their work at a legitimate profit because they have learned; first, receive the customer and "sell" him; second, do the work as well and quickly, as it can be done; third, deliver the job correctly and collect the bill without a dispute.

The first and third of these are subjects in themselves, while the second is one wherein shop machinery plays its big part and as such forms the basis for the following story of a successful organization engaged in selling maintenance.

Special fixture for piston, connecting rod and crankshaft work

By J. EDWARD SCHIPPER

DETROIT has a number of maintenance stations, which, being located right under the paternal eye of the factory, might be expected to incorporate a number of ideas, particularly in the line of equipment and merchandising, which perhaps would not be expected in points further away from the influence of the factory. Some of the maintenance stations in Detroit are used as models and when the dealers come to the factory for a visit they are very often led through these stations with a view of pointing out what the factory really believes to be the ideal in maintenance.

Experiments are, of course, costly, and in some experimental stations the idea of making money is the last thing considered. Others, which are conducted by private organizations and not directly under the financial support of the factory, offer an interesting combination of ideas created by the individual concern and suggestions which have been offered by the factory and incorporated in the general arrangements. One of the latter class is the maintenance departmnt of Williams & Hastings, Michigan distributors for the Hupp Motor Car Company. The following are some notes made on the equipment and layout of the shop.

In considering the equipment used in this service station, it must be remembered that Detroit, being a large city with an extraordinarily big mechanical population, is well equipped with machine shops. Furthermore, the factory is close at hand to fall back upon for certain special jobs, and the equipment which is listed herewith would not perhaps be sufficient for a complete shop located at a more remote point.

In spite of the close proximity of the factory, however, a very complete stock of parts is carried on hand. In fact, every part which has been called for once in the last 60 days has been duplicated and is on hand in the stockroom. Even though the factory is close at hand, delays would ensue which would be very disturbing to the shop routine if it were necessary to hold up jobs while the pick-up wagon went to the factory for parts likely to be called for.

The shop equipment is particularly interesting because of the study which has been made to put everything that is likely to be required in a repair job close to the hands of the mechanic. The foundation of this well-organized station is its bench. A large percentage of the work is conducted at the bench, and upon the conveniences extended to the mechanic depends in a great measure the efficiency at which he can work.

The bench at Williams & Hastings is a one-piece affair 70 ft. long. It is made of 2 by 3 in. maple, set on edge, bolted to the

floor with nuts and lock washers. It is carried on fifteen legs and bolted crosswise to make it as firm and rigid as possible. It is, in fact, so firmly bolted in both directions that it may truthfully be called a part of the building.

At one end are located three special tools used in piston, connecting rod and crankshaft work. These three tools or fixtures are shown. At the extreme end is a piston vise, then a rod lining outfit and a dummy crankshaft for scraping in connecting rod bearings. Individual tool box drawers which are placed beneath the bench. There is one of these for each mechanic, smaller ones for the newer men and large ones for the master mechanic.

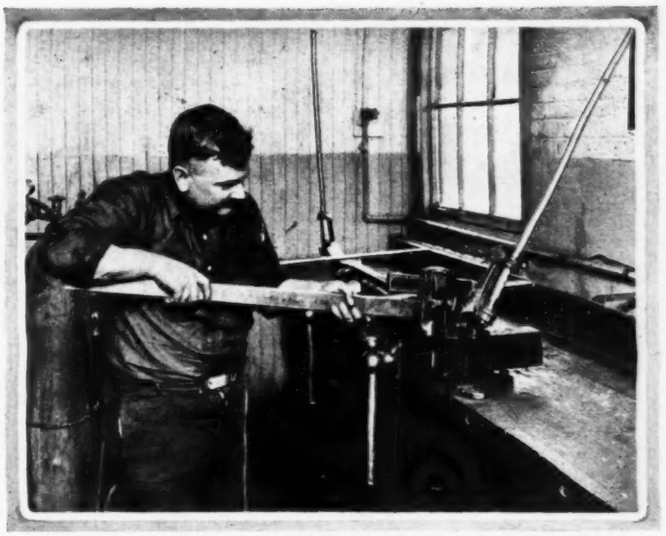
In addition to these three fixtures, there are four swivel vises and three plain vises placed along the bench. Behind the bench are electric light and compressed air connections. There are plenty of double plugs for electric lights, all of them mounted on separate circuits with separate fuses, so that if one blows out it does not tie up the entire line, but the operator may simply plug into another circuit and go on with his work.

Fire extinguishers are located at frequent intervals along this bench, as well as along other parts of the shop, and a very ingenious method of locating them is used. A continuous red line is painted up the side of the wall to the ceiling, so that a man glancing about the shop can quickly pick out the location of a fire extinguisher, regardless of how many objects are around the floor, which would ordinarily obscure the vision.

The compressed air lines are along the whole bench as well as all over the building. Instead of having permanent hose connections to these, bayonet connections are used so that the bench is never littered up with hose unless the air line is actually in use.

At one extreme of the bench there are two heavy vises set with their jaws directly in line. These are lined up within .0001 in. These vises are for straightening front axles and the spacing between the vises is such that the jaws fit right under the spring pads of the axle. This results in a much more accurate job than can be performed at the average maintenance station.

In arranging the machine tool equipment, the thought behind the machines which have been chosen is to make them as elastic as possible and yet, at the same time, to fit the usual types of job which comes in, in a way which makes it possible to positively operate under the flat-rate piece-work system used in this shop. The grinding wheels, drill press and arbor press,

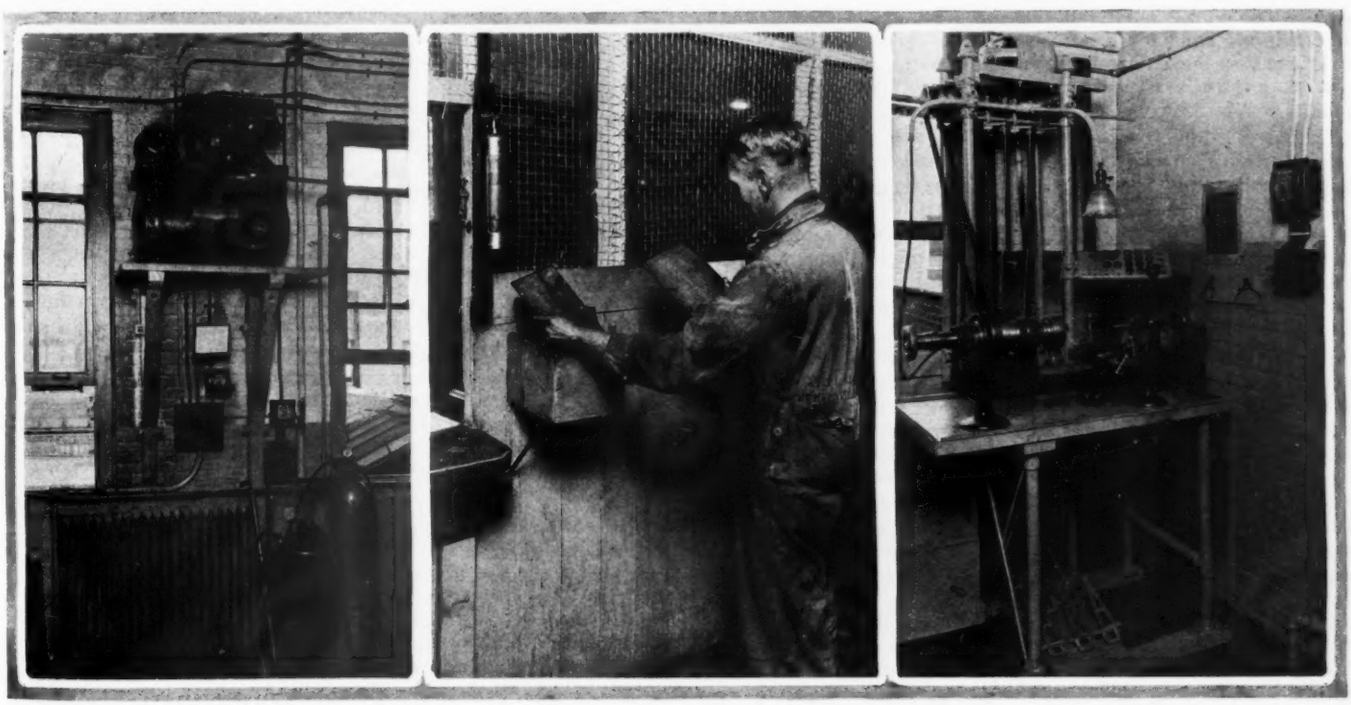


Straightening front axle between specially lined vises

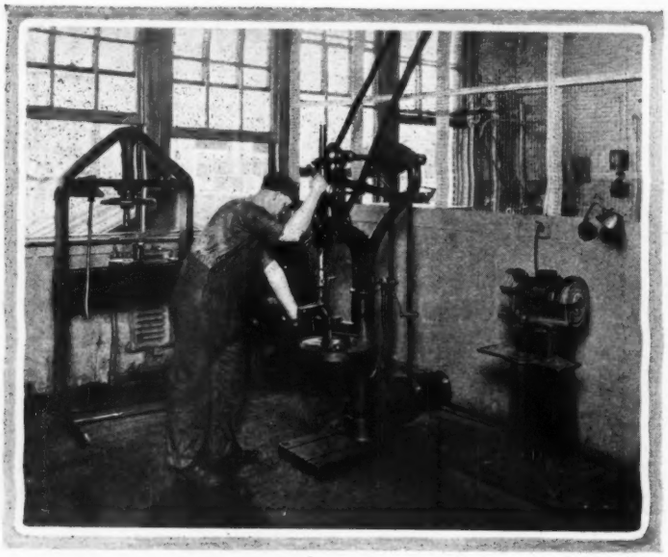
together with the air compressor, are grouped together in one corner of the shop. Location of these is shown in the map herewith. The grinding wheel is manufactured by the U. S. Electrical Tool Co. and is a two-wheel machine. Note just behind the grinding wheel the convenient location of the electric light mounted on a universal fitting which permits it to be turned in any direction. Also note the convenient location of the air hose.

The drill press is a product of the Mechanic's Machine Co. On the table for supporting the work is a swivel vise which affords a ready chucking means for all shapes. The arbor press is a Weaver 20-ton capacity. The air compressor is a product of the Auto Compressor Co. and is a very compact set, including pump and tank. The unusual feature of this compressor outfit is its location. It has been mounted above the floor, so floor space is conserved without any great sacrifice of accessibility of the machine.

The machines described up to this point are all in the outside shop where they are accessible to any of the mechanics. There are some special features of equipment which are located in



Left: The air compressor is mounted on a shelf to conserve floor space. Center: Mechanics looking over work instruction cards giving step-by-step instructions for flat rate jobs. Right: Cataract high speed lathe used for variety of purposes



Arbor press, drill press and grinder locations

the tool room, being of a more delicate nature and, consequently, available only under the direct supervision of the shop superintendent. About the most interesting piece of equipment in the tool room is a Parker grinder, drilling and turning machine.

This machine is suitable for a tremendous number of the small jobs found in automotive repair work. The head on this machine can be set to any angle and there is both a vertical feed and a cross feed. For such jobs as grinding valve seats, refacing tappets, refacing tappet adjustment screws, turning grooves in any direction, it is capable of doing work to exceedingly fine and close limits in a small space of time. Behind this machine may be noted a Cadillac Tool Co. centering outfit equipped with an amplifying gage for checking eccentricity.

The most expensive tool in the entire shop equipment is the Cataract speed lathe, which is also carefully housed within the tool room, and it is used by only the most competent mechanics. This machine, which is gaining considerable favor in high class shops, is capable of a wide range of work. With the various speed combinations provided, more than twenty combinations can be worked out. It is capable of extremely close work on such important jobs as turning bushings and, in fact, is known as an extraordinarily well developed speed lathe.

There are some special tools and fixtures which have been worked out in the shop itself. A great many of these are kept in the tool supply bench, located in the tool room. On the lower bench at the right end, two of these special fixtures may be noted. One of them is a dummy flywheel for use in locating and checking work done on the clutch housing. Another is a dummy rear wheel brake hub for lining brakes, burning them in and other operations requiring checking against a master drum.

This tool bench also holds such necessary pieces of equipment as lead mallets, rubber mallets, all kinds of files, feelers for tappets, these being mounted in wood handles, by the way, for convenience in handling, as the average feeler gage is too short for convenient work on tappet adjustment. A pair of extra long tappet wrenches is also provided for the same reason. Another ingenious little fixture found on this bench is a dummy front wheel hub with an Alemite attachment screwed into it for lubricating the front wheels. This makes a very convenient and rather clever method of applying the lubricant for this point.

Another unusual arrangement to be found here is the Bear Mfg. Co. wheel lining outfit located on the top shelf, at the left. The unusual feature of this is that the wheel lining outfit is held in a fixture on the bench. This fixture is made of flat stock and is absolutely accurate in alignment, so that before passing out the tool to the mechanic, the tool room keeper can check its alignment very rapidly. He can then check it when it is turned back in, and this furnishes not only a check on the tool itself, but also something of a check on the work which has been done with it.

A part of the equipment of the shop is the Van Dresser cylinder reboring tool, familiar to readers of MOTOR AGE. The only change which has been made in this is that casters have been put under the tool box so that it can be rolled up to the job in the box without forcing a mechanic to do the heavy work of carrying the box, and further, which is quite an important item, preventing the box from dropping and breaking the tool or attachments.

Among the miscellaneous articles carried in stock in the tool room is ether. This is used not only for cleaning cloths but also for starting frozen rear wheels. It has been found that rear wheels which absolutely refuse to respond to the wheel puller will sometimes be broken loose sufficiently for the wheel puller to get in its work, by the application of ether. This is probably explained by the action of ether in cutting through grease which has become so hard as to virtually act as cement. Ether, of course, is known for its ability to penetrate where other materials fail.

Other articles found in a survey of the shelves of the tool room include a first aid kit, a considerable quantity of Dixon's motor graphite, used on applications after repair jobs to valve stems, piston tappets, wrist pins, and even in some cases for feed in through the intake to establish an initial film in an engine which has been overhauled. There is a Walker micro-gage for testing out-of-round in cylinder barrels, air rivet hammers for not only riveting but for cutting the heads off rivets where a job has been torn down.

A special tool which has been worked out at Williams & Hastings and which will no doubt be taken up at the factory is a steering column expanding tool. This is a little expander which is put in to take up the tube bushings. It reverses the usual process, which is somewhat expensive and difficult. That is, it expands the tube to fit the bushing rather than fitting the bushing to the tube.

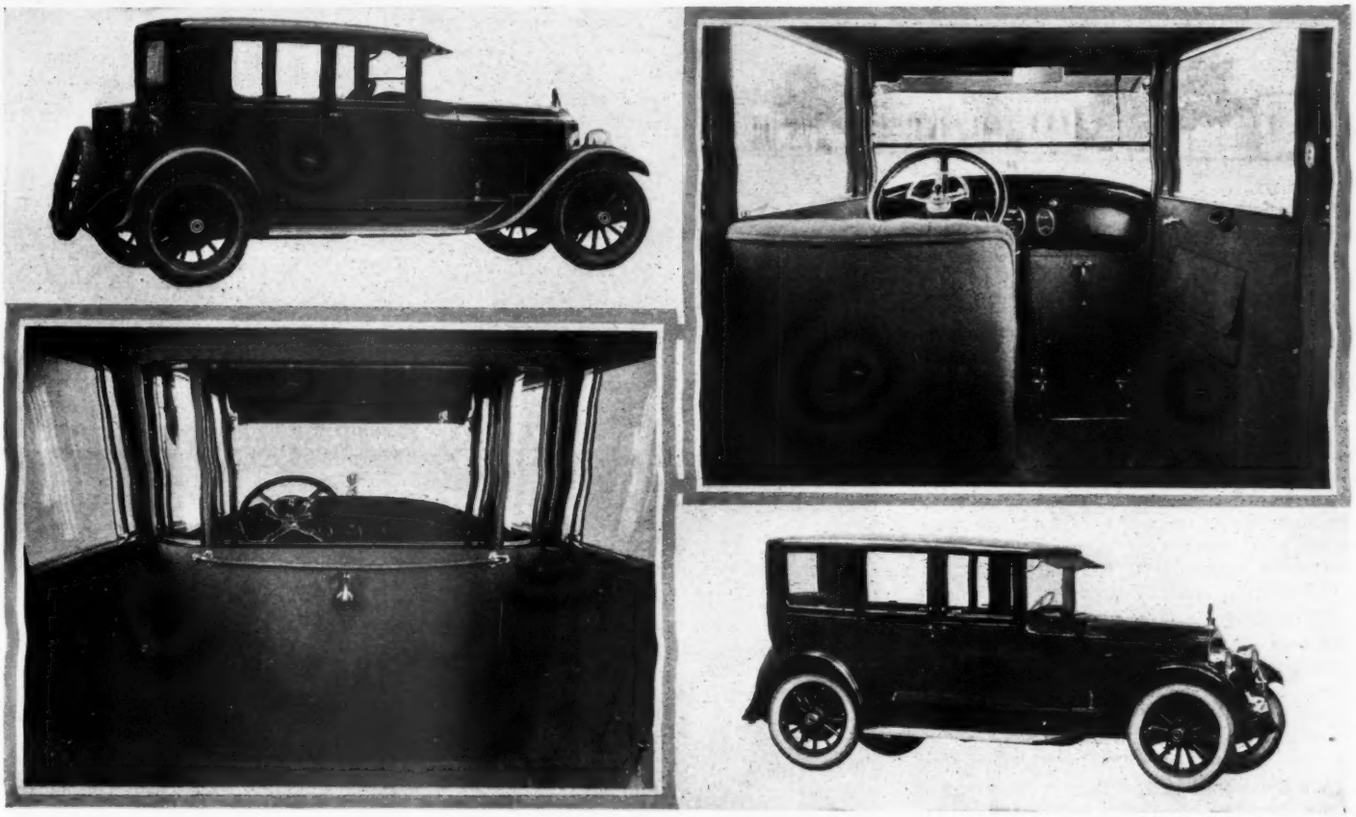
There is also an S. B. Electric & Manufacturing Co. trouble shooter, a complete set of reamers and taps which are kept in wooden shelves with oil grooves directly to the shelf. By pouring oil on the top shelf, all of the reamers are kept soaked in oil and this drains to the bottom shelf by a system of troughs so that no rusting troubles are experienced.

A clever method of preventing theft of oil is employed. The oil is carried under pressure tapped off the main line through a reducing valve which applies a pressure of 25 lb. per sq. in. on the oil tank, the oil pipe lines running to several convenient points through the shop. The reducing valve is located in the tool room and the last job of the tool room keeper is to let off the pressure on the oil line at night and then lock the valves. With the pressure off the oil, no flow is of course available at the various taps and, consequently, even if the taps were turned on, oil could not be stolen.

For the convenience of the tool room keeper, tools most called for are held in a shelf located right under the tool room window counter. As an assistance to the men working on the job, for the selection of their tools as well as a knowledge of how to go about the work on unfamiliar tasks, the step-by-step processes of the standard flat-rate jobs are mounted on individual cards for each job in a box adjacent to the tool room window. These give complete instructions for the job and, of course, furnish information which tells what tools to use. This equipment in combination with the flat-rate system, has enabled the mechanics in this shop to average 90 cents per hour while on the piece-work schedule and 70 cents per hour on all jobs, as there are, of course, a number of jobs on day work, as is usual in flat-rate shops.

One feature which might be noted in connection with the flat-rate, piece-work system as conducted here is that, on certain jobs where it is impossible to check the work without going all over it again, such as that of tuning an engine, a minimum time is established. On this particular job, 1 hour is established as a minimum, and if the man were to finish in three-quarters of an hour he would have to sit down on his job 15 minutes before he could turn in his card. This is done to secure careful workmanship on jobs where the inspector cannot conveniently come to a rapid conclusion as to whether the work is done right or wrong.

Packard Adds 5 Passenger Coupe and Sedan Limousine



Packard has added two models to the single six line, a 5-passenger coupe and 5-passenger sedan lomousine. The chassis of these has a 126 in. wheelbase and one of the many little conveniences on the coupe is the trunk, neatly mounted on the after deck. The grouping of the instruments is interesting. The lighting and ignition switch constitute one oval, clock and speedometer the center oval and the right one houses the ammeter and oil pressure gage

23 Years Ago *This Week In* Motor Age

Touring Was Not What It Is Now

TOLEDO, Sept. 30—The trans-continental automobile trip of Mr. and Mrs. John Davis has not proven a great success up to date. For nearly a month the Davises have been trying to get out of Toledo, but without success. Repair work on their machine kept them here three weeks. A week ago Sunday, they broke away from the city, but their tour was short lived, for in Michigan, less than a score of miles from here, they broke down again and are stalled. The automobilists were to represent a newspaper syndicate.

A half page illustration under the caption, "First American Racing Vehicle," shows Alexander Winton's 15 horsepower racing vehicle. It was built for a projected race with Charron, which never was held, and thereafter the builder issued a challenge to all comers.

From an article on the Woods Motor Vehicle Co.:

The attorneys of the Woods Motor Vehicle Co. state that the stock, $10,000,000, is all subscribed and that none will be offered to the public, and the newly elected president, Frederic Nicholls, president of the Canadian Northern Railway Co., adds that the capitalization will all be real capital and will be invested in a number of manufacturing plants by which it is hoped to bring the capacity up to 100 vehicles per day. At 300 working days and an average price of $1,500 per vehicle this would bring the selling value of the company's annual production up to the astonishing figure of $45,000,000.

Among directors of the company were John W. Mackay, president of Commercial Cable Co., and August Belmont, New York banker.

The General Electric Automobile Co., 408 Bourse Building, Philadelphia, has published an illustrated descriptive catalog. The company has an exhibit at the Philadelphia Export Exposition and has under construction new styles of electric broughams, light and heavy delivery wagons, trucks and light pleasure vehicles.

Before the Days of the Sherman Law

At a meeting in Chicago on Sept. 20, manufacturers of electric motors, formed a temporary organization. The object of the new association is to maintain prices in the trade. The cost of raw materials, iron, steel, copper and other materials, has advanced 25 to 50 per cent within the last few months, and it is the desire of the electric motor manufacturers to effect a corresponding increase in the price of the finished article.

Changes in Design of Jordan Sedan and Brougham

COINCIDENT with the lowering of enclosed car prices, the Jordan Motor Car Company announces a number of slight changes in the equipment and design of both the brougham and the sedan.

The sharp corner lines of both bodies have been changed to a broomstick radius. Roof lines have been lowered two inches and the seats lowered a corresponding amount. The rear seats have been made wider and the pitch has also been changed slightly to give greater comfort.

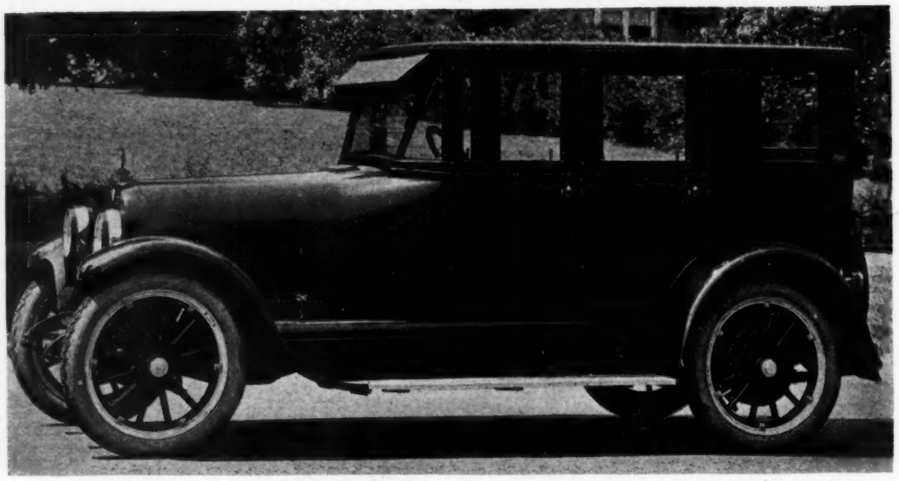
Both bodies are now being trimmed in Windsor Weave Cloth in colors to harmonize with the body finishes. In the brougham this cloth is worked in plain trim, without plaits over Marshall cushion and back springs. In the sedan, however, plaits are used in the upholstering. The best quality curled hair is used in both jobs to make the cushions soft and still maintaining their shape.

A worm type regulator has been incorporated in the doors in place of chains which are sometimes noisy. Removable panels make it easy to get at the regulators if necessary, or to replace glass without tearing out the trimming.

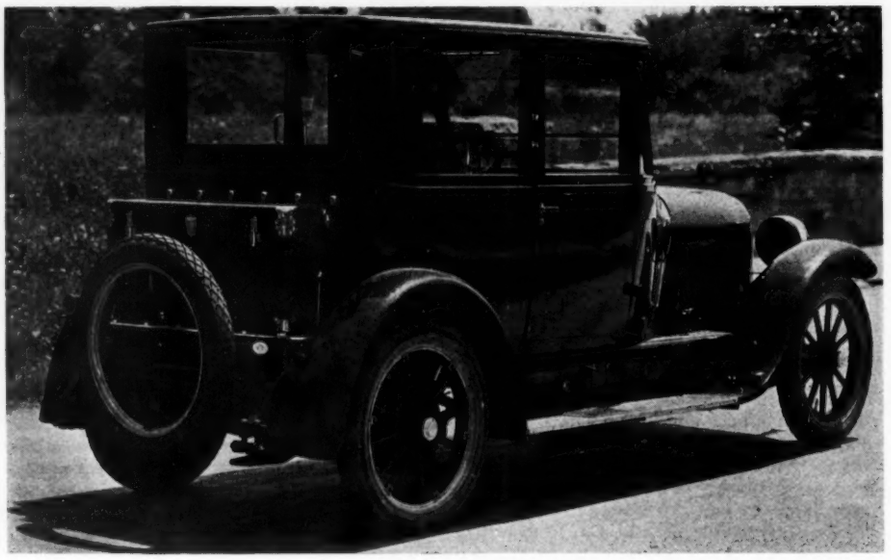
Platinum finish hardware in dome lights, door pulls and regulator handles is now standard in both models. A new steering wheel with walnut spider and rim is now standard on both enclosed cars. Small, polished aluminum controls are mounted in the center.

The sedan body has been lengthened to allow room in the front compartment and a little more in the tonneau. An extra large trunk of black Fabricoid with nickeled brass corner plates and trimming has been mounted on the rear of the brougham. This trunk carries two large suitcases and an extra compartment for golf shoes or packages.

Both the brougham and the sedan forferly priced at $2785 are now quoted at $2485 f. o. b. Cleveland.

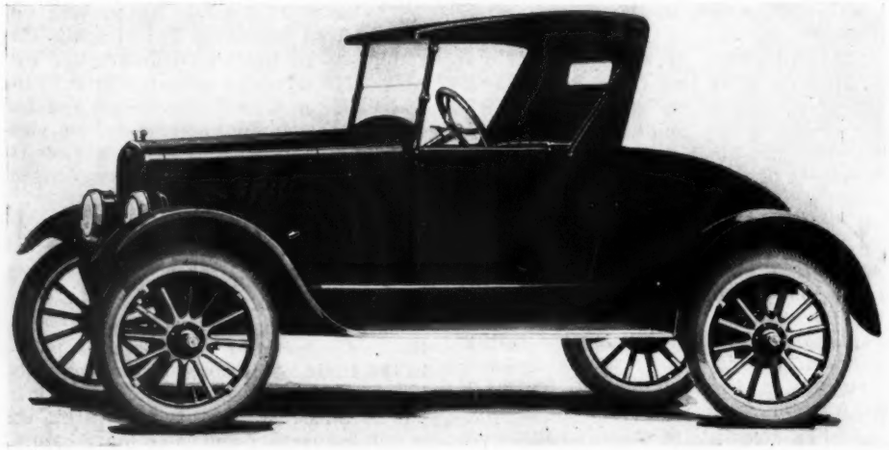


Jordan Sedan, priced at $2485 f.o.b. Cleveland



Jordan Brougham, showing trunk equipment

Gray Announces Roadster Model



The Gray roadster, which sells for the same price as the touring model, $490. The compartment in the rear has been made quite large to make the car useful in a commercial sense, and the rear deck is detachable so that a small commercial body may be easily attached

HOW MUCH IS A "LITTLE SERVICE?"

A member of MOTOR AGE staff recently drove into a garage and asked for a quart of a certain kind of oil. He was informed that the dealer did not have that kind but was not informed that he could have a kind just as good.

He was about to back out when the dealer said, "Say, just a minute, I think this new fellow across the street handles that brand, wait and I'll see."

He went across the street, returned with the oil wanted and put it into the car. This man at least believes in making friends with the "new fellow across the street" and also rendering a little service to the owner.

Oil Resources 63 Billion Barrels

The oil resources of the world are estimated by the U. S. Geological Survey at 63,000,000,000 barrels.

Packard Is Back in Automobile Racing

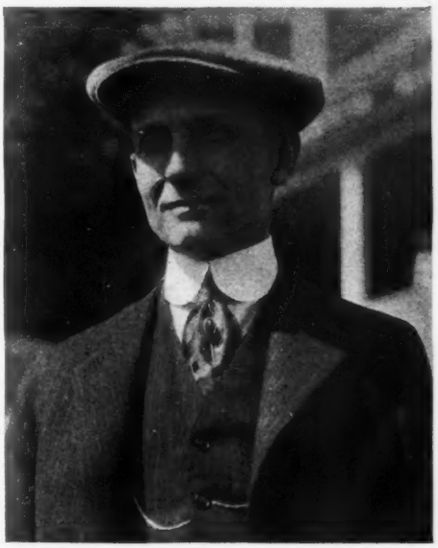
Will Pit American Engineering Skill Against European Advance in Design of New 122-cu. in. Class

INDIANAPOLIS, Ind., Sept. 30—Packard Motor Car Co. will return to automobile racing in 1923 with a factory team, the first of the big factories to engage in the speed sport after once having retired. Incidentally, the Packard will be the first of internationally famous American factories with big production to engage in racing in the last decade.

This was announced by T. E. Myers, secretary and general manager of the Indianapolis Motor Speedway, who has been advised by Col. J. G. Vincent that the Packard team would participate in the eleventh annual 500-mile international sweepstakes race next Memorial day. Col. Vincent is vice-president in charge of engineering of Packard. He is the co-designer of the Liberty motor and recently won the Gold Cup at Detroit, the national power boat championship.

The Packard company has two reasons for entering the coming race. The 1923 event will be for cars powered with engines not to exceed 122 cubic inch piston displacement, being smaller than any engine manufactured for production automobiles in this country. European engineers have made rapid strides in the perfection of engines of this size and smaller. The engineering fraternity knows that with a new class the race this year will be won on an engineering basis, and Packard is confident enough of its ability to pit its product against the best in Europe.

The other reason is the national pride of the company and Col. Vincent, believing that this year Europe will be much further advanced in the perfection of its racing creations, and that America, to compete successfully, must do so with organized teams, which can only be efficient when backed by financial support



Colonel J. G. Vincent, Vice-President of the Packard Motor Car Co., has announced Its Return to Racing

and mechanical service which only a factory can give.

Col. Vincent has not given out the details of the construction of the cars, but they are now being built by the Packard organization. Three types of engines will compete for the $50,000 purse—four, six and eight. Packard has selected the six for its team because it believes the six will be most efficient in competition in this class. The cars will be one-man, with the driver seated in the center. No drivers have been announced.

The return of Packard to racing will revive memories of the Packard "Gray Wolf," which was a sensation fifteen years ago and one of the most successfully campaigned cars in the days when the acme of speed competition was achieved on the dirt tracks and beaches. It will also call to mind the campaign of Ralph de Palma four and five years ago, when he successfully campaigned a Packard twelve on the speedways.

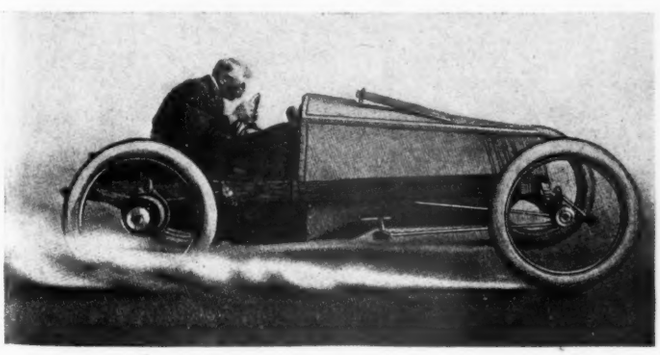
Ralph de Palma has been engaged by Packard Motor Car Co. as a consultant in the building of its team of racing cars for the Indianapolis event of 1923. He is working with Col. Vincent and the Packard engineering staff in perfecting the design of the cars.

—

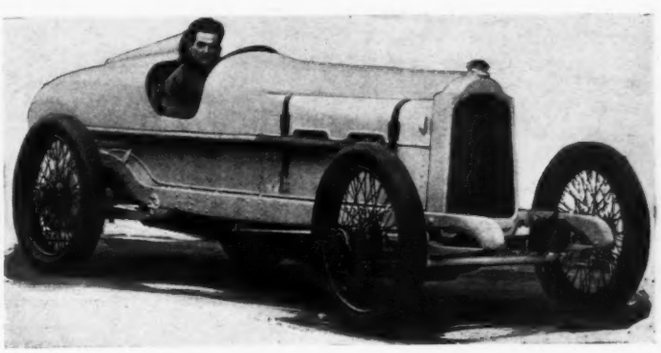
DETROIT, Mich., Sept. 30—Packard Motor Car Co. is re-entering racing as a means of testing out new engineering principles and theories of design under the extreme conditions which racing presents. The team entered in the 1923 race will drive under the personal direction of Col. J. G. Vincent, vice-president in charge of engineering, who will be in the pits throughout the running of the race. Under his direction, tabulation of the data afforded will be made.

According to Col. Vincent, the changes in piston displacement defined by the race authorities means a complete revision in designing the engine. The race will be largely a contest of engineering skill, he declared, and companies like Packard should engage their best efforts against those of European companies, that there may be no question of the ability of Americans to compete with Europe's best.

The qualities of the six-cylinder motor will be most strikingly demonstrated in a test confining the engine to a minimum displacement, he said. A wealth of engineering data should be afforded by the running of the race under the conditions set, and progress made as a direct result of this which might otherwise not be made without the lapse of considerable time.



Packard "Gray Wolf," a famous racer of 15 years ago



Ralph De Palma is acting as a consultant in designing

New York Closed Car Show

Left—Top: A typical display space. Center: Nash 4 door sedan. Bottom: New steel body Reo. Right—Top: Stephen 5 passenger 2 door sedan. Center: Oakland and Earl. Bottom: General view of display floor

New Models and Brisk Sales Feature New York Closed Car Show

First Fall Event Promoted by Gotham Dealers Proves Marked Success

TWO facts stand out in connection with the New York Closed Car Show which ended last Saturday. A large proportion of the attendance was composed of people who had made up their minds to buy enclosed cars and were using the show as a convenient means of comparison of cars. Sales ran in a decidedly satisfactory manner in both the popular makes and those in the slower moving classes.

The first night did not bring out the throngs of sightseers that go to the mid-winter shows. It was a serious, plainly interested crowd that drifted through the aisles, admired the cars, climbed in and out of some of them and, in contrast to some show crowds, indicated an active buying interest by rather freely giving names and addresses to salesmen. The sales staffs were noticeably alert, showing the effects of training in preparation for the contest which offers money prizes every night for the best examples of salesmanship observed by sleuths working incognito for the managing committee.

The new York Closed Car Show was the first to exhibit low-priced enclosed cars, with soft tops and other cost-reducing features, in numbers almost as great as the conventional, higher-priced types. It was an enclosed car show, not a salon. Luxurious models were there, but they did not stand alone, as in enclosed car shows of former years, serving notice that the person who would step up from his open car must pay a big price differential. Alongside the "regulation" sedans and coupes in many of the exhibits were brand new or recent models of the new school of design which is rapidly narrowing the gap between enclosed and open car prices.

The show visitor could not walk the length of a single aisle without getting the impression that the industry has been putting itself earnestly to the task of bringing enclosed cars within the reach of a far greater number of pocketbooks than in former years. The trade, of course, has realized this development, and so has the public to some extent, but the metropolitan Closed Car Show has offered the first opportunity to give it the emphasis that so important a movement deserves. First-night visitors were heard on all sides making the comment, "I had no idea they were getting these enclosed car prices down so low."

This show, the first ever held by the New York dealers in the Grand Central Palace, where the national show has been held for several years, presented the enclosed car products of 54 manufacturers. There were also a number of truck and automotive equipment exhibits.

In the show were 16 new body models brought out by 11 manufacturers. Several of these bring their makers for the first time into the growing group of producers who are offering the public virtually three classes of cars, open, lower priced enclosed and higher priced enclosed.

New Bodies at New York Closed Car Show

Cole two door sedan	$3685
Chandler five passenger limousine	2895
Chandler town car	2895
Lexington two door brougham	2645
Liberty Commander cabriolet	1695
Maxwell Club coupe	985
Nash Six four door sedan	2040
Oakland five passenger coupe	1545
Oakland four door sedan	1445
Oldsmobile two door brougham	1425
Packard limousine-sedan, single six	3275
Packard coupe	3176
Reo Model C sedan	1885
Reo Model C coupe	1835
Stephens two door sedan	2195
Willys Knight seven passenger sedan	2195

Pictures of new bodies at the show will be found on pages 16 and 19.

The New York dealers did a creditable piece of work in in the presentation of the show. The decorations, while dignified and attractive, were in keeping with the educational idea of the show —to suggest the closed car not merely as a winter car, but as the ultimate automobile of the average American family or business man looking for utility and comfort.

There were some dealers in the show who were exhibiting merely because their competitors were. They can't get closed cars enough to fill orders and don't expect to catch up before mid-winter. They don't need the sales promotion assistance that the show furnishes, it is true; but haven't they overlooked the value of the exposition, particularly at this stage of the development of lower priced enclosed cars, as a means of educating the public to the closed car idea and so laying the foundations for a more stable, year-round business in future years?

On the floor of this show were several hundred specimens of the enclosed car builders' highest art, shown with facilities for ease of comparison of make with make, model with model. The Grand Central Palace for a whole week was talking enclosed cars; so were the newspapers, and so were thousands of people who flocked to the show. Isn't this worth something to the trade, even to distributors and branch managers who, just at this moment, are oversold on enclosed cars? Wouldn't a similar educational effort be worth something to the trade in other large centers? For a year or two, at least, while the industry is building up the enclosed car idea, aren't all well promoted, well managed enclosed car shows of value to the industry as a whole?

The show received a good deal of attention in the newspapers through holding special days with special features arranged for each. Monday was Family Day, and it was announced that all families of eight or more presenting themselves at the doors would be admitted free of charge. The record family, which came from a suburban town, consisted of a husband and wife and 21 children, all of which, they claimed, were their own. Families of eight and more were numerous. The newspaper men made quite a bit of this feature and the show got a good deal of publicity of the kind that cannot be bought.

Tuesday was set aside as Actors' Day, when a committee of stage people were to take part in selling cars in some of the exhibits.

Another publicity-commanding feature in connection with the show was a contest among high and grammar school art students for the best paintings suggesting ideas for construction and decoration of automobile bodies. Well known artists were selected as judges, and their prominence contributed to interest in the competition and so in the show.

The show presented the current enclosed models of nearly all types of the 54 manufacturers represented by their metropolitan agencies. Especially noticeable, in addition to the soft top models, were cars showing a trend of some manufacturers toward two-door sedans and coupes with the wider windows made

possible by this arrangement. Novelties included a Pierce-Arrow limousine with two windshield cleaners and a Dodge Brothers town car, a special job, with the sunshade built integral with the top. A number of exhibitors had special body and paint jobs, the latter decorating the show with frequent bright spots of color.

Two new Chandler bodies at the show were the limousine at $2,895 and the town car, $2,895. Both these models are fitted with what has become generally known as "sport" equipment, including aluminum steps with individual fenders and splashers, drum type headlamps and so on. Sliding glass panels divide the driving compartment from the rear compartment and a locking device prevents shifting of the panels. The limousine carries five passengers in the rear and is equipped with all the usual fittings of a car of this class and also has a dictaphone for communication with the driver.

The Nash chassis has been changed slightly and a new four-door, 5-passenger sedan is added, this being $2 040. Among the chassis changes are the addition of five cross braces in the frame, which still further prevent frame weaving. Although these braces were added primarily to prevent flexing of closed bodies, the open bodies are fitted to the same chassis. Another feature of the closed jobs is the copper guttering of the windshield sides to prevent leakage of water.

A new Oldsmobile body is the brougham at $1.425. This is a two-door body with a seating capacity of five and uses the tilting front seat. A feature of the design is the rear carrying compartment which is reached from the outside. A cover, curved to conform to the body lines, is hinged at the top and can be locked. A strut holds it open when access is desired. The tools are all buttoned to a board which drops from this cover and beneath this is space for a considerable amount of luggage.

Two new bodies are added to the Reo line, these being of steel and comprising a sedan at $1,885 and a coupe at $1,835. They are to be known as model C and will be produced along with the aluminum bodied coupe and sedan which have been in production for some time at a higher price. The price of the aluminum bodies remains as before at $2,355 and $2,435. The new steel bodies are being built in the Reo shops and an option of either wood or disk wheels is offered.

A new five-passenger, two-door sedan is added to the Stephens line, this being priced at $2,195. The tilting front seat arrangement is used and the equipment through is of the sport class, including drum type headlamps, a trunk with double suitcase in the rear and aluminum bars on the rear of the body.

The new Oakland sedan and coupe, both Fisher built, made their debut at the show. The sedan, a four-door job, is priced at $1,445 and the coupe which has a five-passenger seating arrangement with tilting front seat, is $1,545. The coupe, which is $100 higher in price than the four-door body has considerable additional equipment, including a platform for a trunk, aluminum back rails, etc. Equipment on both the models is of the sport character.

The Packard line is augmented by the addition of a coupe and a five-passenger limousine-sedan to the single six chassis. The coupe has a seating arrangement for four and is priced at $3,175. All window and door glasses lower flush with the sills. The limousine-sedan is $3,275.

A new seven-passenger sedan, to be known as Model 27, fills out the Willys-Knight line. The price of this job is $2,195. The chassis is identical with the regular model.

A two-door brougham is added to the Lexington body selections. The rear seat is quite wide and deep and has an unusually high back. The two front seats are of chair type, the right being of the tilting type. There is a trunk at the rear which contains two removable suitcases.

Cole has made several changes in its closed bodies, including the addition of a cowl ventilator. Due to the ventilation secured by this means the lower part of the windshield has been made fixed. The closed bodies have three-quarter running board. The wheel equipment, consisting of six wheels, is optional, wood, wire or disk. The price of the two-door sedan is $3,685.

A new cabriolet to be known as the Commander is added to the Liberty closed models. The price is $1,695. The dash is finished in walnut and a walnut molding is used on the interior. The interior finish is gray with leather upholstery. The exterior finish is maroon. The equipment includes clock, cigar lighter, windshield cleaner and cowl ventilator.

A new Maxwell body is the club coupe at $985. It is featured by quarter windows which drop full length in place of the solid, fabric-covered quarter sections which are generally used in connection with two-passenger coupes.

The seating space is arranged the same as the Maxwell roadster. The ventilation features have been given particular attention by the arrangement of the quarter windows and by the special type of windshield which has been adopted for all the Maxwell closed cars. Both sections of it swing outward, the upper half being hinged from the top and the lower from the bottom. To keep the windshield weather and water tight the entire assembly is set around a rabbet.

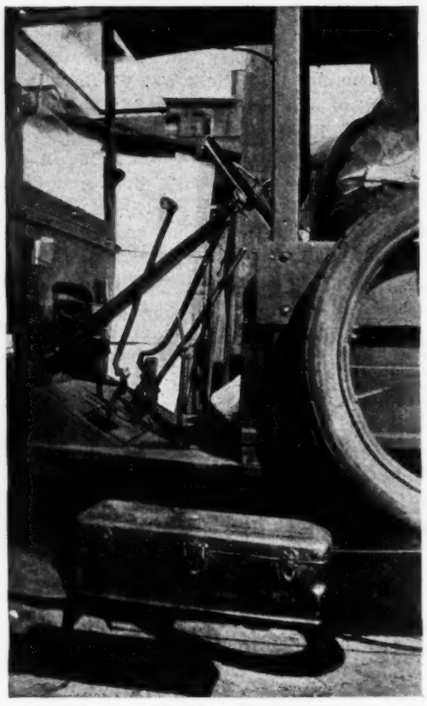
97% OF AUTOMOBILE DRIVERS ARE CAREFUL

Ninety-seven per cent of automobile drivers are careful, according to inspectors of the Pennsylvania Railroad who checked 30,378 cars at grade crossings in five states. The educational campaign of the automobile industry, the Cross Crossings Cautiously drive of the railroads, and the efforts of many other organizations are being pushed to eliminate the 3 per cent of careless drivers.

Device Makes Ford Car Entirely Hand Operated

An absolutely hand operated Ford truck is being used every day in Cincinnati, being driven through heavy traffic by the owner, J. A. Callahan, ice dealer and expressman, who being without the use of his lower limbs, conceived the idea of installing levers to take the place of the necessary foot manipulation.

The levers, as shown in the accompanying illustrations, were installed by a blacksmith who enjoyed a hearty laugh at the expense of Callahan. But

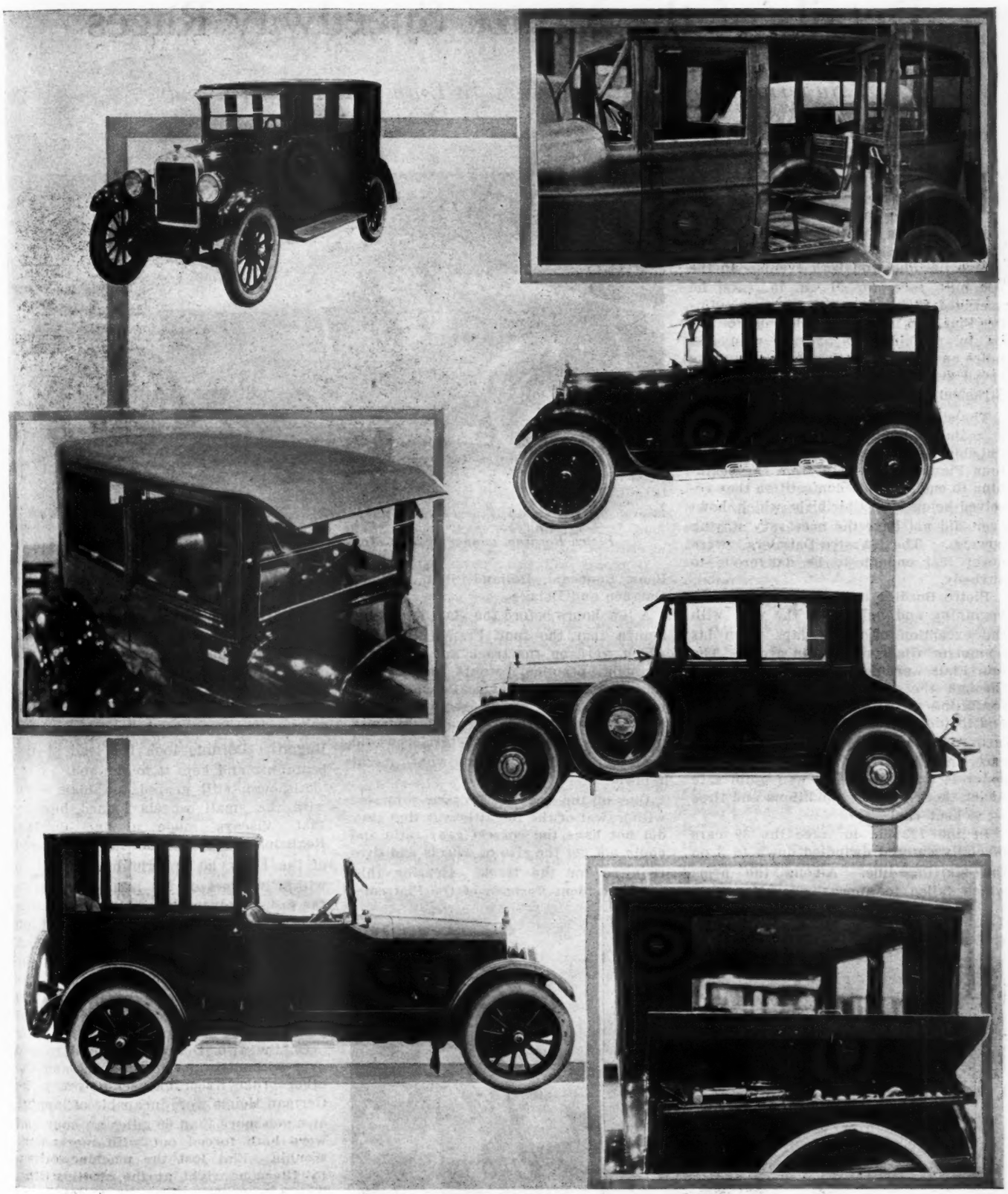


These simple lever extensions made it possible for a cripple to operate a Ford car without using his feet

he looked with amazement as the owner drove the truck from the blacksmith shop with as much ease as though it was foot manipulated. Two holes are drilled in the foot pedals and the levers attached thereto with bolts. The low speed lever has a hand grip, as has the brake lever, while the reverse is a perpendicular bar.

The levers are the original idea of the owner. As shown, they are in easy access of the driver. Besides having this advantage they also serve to preserve the mechanism, according to the owner, who says his repair bills are far less than some truck owners with foot manipulated machines.

Callahan has used the truck, a used one, to begin with, for eight months and the transmission bands are in excellent shape, the owner contending that with the hand operation there is less strain on the transmission.



New York Closed Car Show

Left—Top: Oakland 4 door sedan with Fisher body. Center: Dodge with Bridgeport body, using a sunshade integral with top. Bottom: Chandler. Right—Top: Marmon body exhibit with framing showing, Reo steel body sedan model C, Cole 2 door sedan. Bottom: Oldsmobile, showing tool arrangement and storage space

Details of the Monza Speedway Races

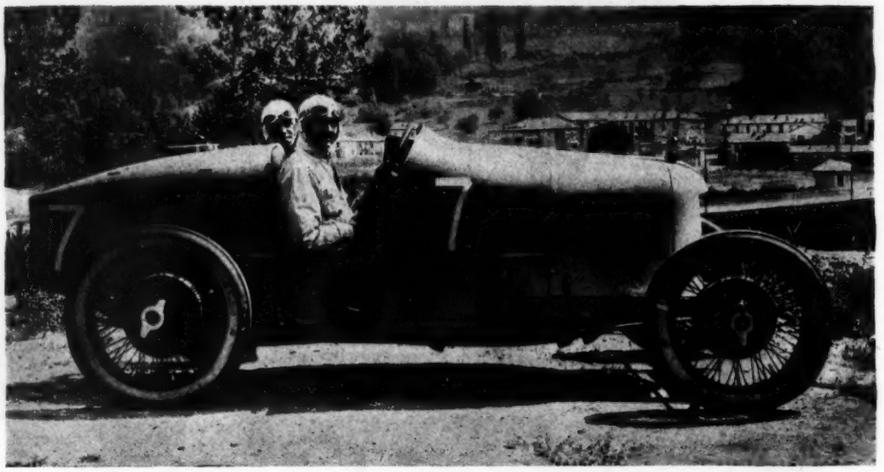
Superiority of the Fiat Racers, in Both the 91 Cu. In. and 122 Cu. In. Classes Is Demonstrated

TWO long-distance races were organized for the opening of the new Speedway built by the Automobile Club of Milan in the Royal Park of Monza, eight miles north of Milan. Pietro Bordino won both events. In the 373 mile race, for 91 cu. in. cars, he averaged 83¼ miles with his four cylinder Fiat, and in the 497 mile race for 122 cu. in. machines his average was 86.89 miles an hour. In both races the average speed set in the French Grand Prix at Strasbourg was exceeded.

The starters in the 91 cu. in. race were a team of four Fiats, three Italian Chiribiris, and two Austro-Daimlers. The four Fiats led the field from the beginning to end, the only competition they received being from Chiribiris, which, however, did not have the necessary staying powers. The Austro-Daimlers were never fast enough to be dangerous to anybody.

Pietro Bordino took the lead from the beginning and held it to the end, with the exception of a few laps when his teammate Giaccone got in front. The four Fiats were never headed; they went through the race without stop, except for filling up with gas at half distance, and the drivers never touched their tires. Heavy rain fell throughout the entire race, but the track, which is made of concrete and tar coated, was quite safe under these weather conditions and tires were kept cool.

In the 122 cu. in. race the 39 cars officially entered dwindled down to 8 on the starting line. Among the firms which failed to appear were Mercedes, Benz, Sunbeam, Rolland-Pilain, Talbot-Darracq and Delage.



Pietro Bordino, winner of both Monza races, in one of the Fiat 91 cu. in. cars

A few hours before the start it became known that the four French Bugattis, which were on the track and had gone through practice, would not start. Bugatti maintains that a "People's Committee" invaded his bedroom early on the morning of the race and informed him if his cars did not start it would not be responsible for what might happen.

One of the reasons for the proposed withdrawal of the Bugattis was that they did not have the correct gear ratio and could not get the size of wheels and tires required for the track. Hearing this, Vice-President Fornaca of the Fiat company offered to loan wheels and tires to his rival. The offer was accepted and the start of the race postponed for half an hour in order to allow Viscaya's Bugatti to come to the starting line.

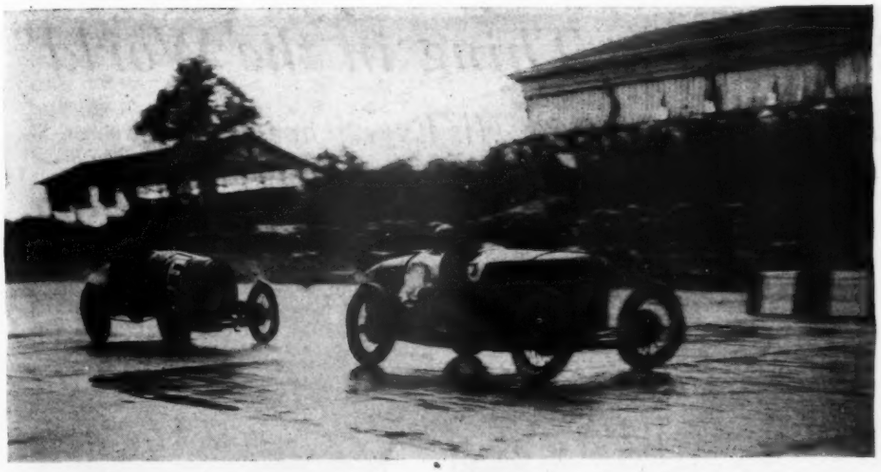
In addition to the three Fiats, driven by Bordino, Nazzaro and Giaccone, the competitors were a couple of Italian Biattos, two German Heim cars and the Bugatti. Bordino took the lead at the beginning and kept it to the end.

Although still geared too high, even with the small wheels loaned him by Fiat, Viscaya made a fine display. Realizing that he did not have the speed of the Fiats, he brought his Bugatti to within six feet of the tail of Nazzaro's car to take advantage of his suction, this practice not being contrary to European racing rules. Nazzaro shook him off once by suddenly running down from the top of the banking to the inside of the track, and on a second occasion Viscaya had to abandon the tow by reason of plug trouble.

Of the two Diatto cars, one turned over without injury to the crew and the other broke its crankcase hanger. The German Heims were incapable of lapping at much more than 60 miles an hour and were both forced out with mechanical trouble. Fiat lost the machine driven by Giaccone right at the starting line. The car made a leap of a couple of yards and then stopped dead, either with a broken universal or a stripped drive pinion.

The two other Fiats ran throughout the race without any mechanical trouble and the one driven by Bordino never stopped its engine. Each one filled up with gas at half distance. Bordino changed a couple of rear tires, while

91 cu. in. Fiats waiting for the start of the Italian Grand Prix race. The wet weather, apparent in this picture, lasted all day, but had no bad effect on the track



Viscaya, in his Bugatti car, taking advantage of Nazzaro's suction to help him overcome the handicap of improper gearing and wheels

Nazzaro went through without a tire change. The crowd got on the course after the Fiats had finished and prevented the Bugatti going the entire distance.

It is freely admitted that in the construction of both 122 and 91 cu. in. racing cars Fiat has an enormous advance on other European makers. Many rivals frankly acknowledge this and give as their reason for not going to Monza that it would have been folly to face such competition.

The two sets of cars are identical in design, the only structural difference being that the 122 in. engines have six cylinders of 2.5x3.9 in. bore and stroke, while the 91 in. engines have four cylinders of 2.5x4.4 in. bore and stroke. With two cylinders less, the hood can be shortened and in consequence the wheelbase is reduced. Many of the parts in the transmission are identical in the two sets of cars; the difference in weight between the 122 in. and the 91 in. cars is only slight.

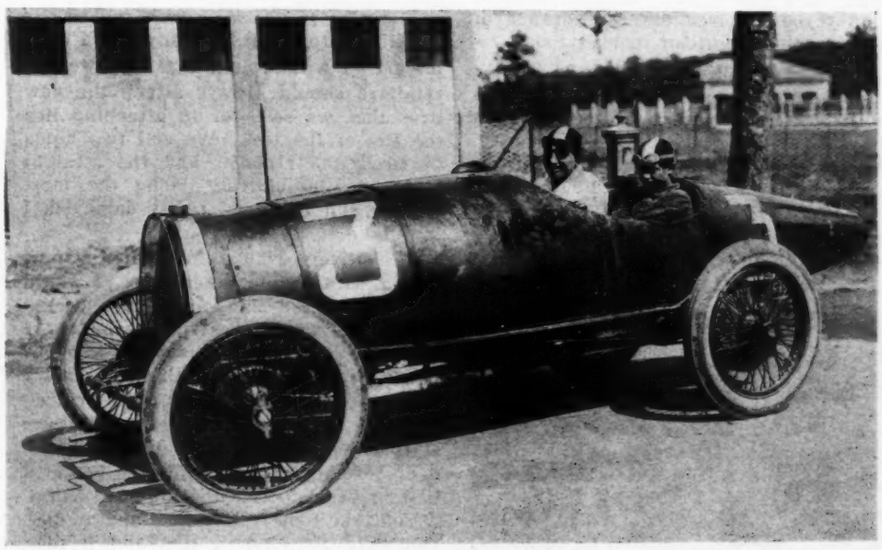
These cars are the result of three years' uninterrupted work by the technical department of the Fiat company, the men most directly responsible for the success being Chief Engineer Forcana and Avoccato Cavalli, head of the technical service. Signor Cavalli attributes the success not to any one outstanding feature of design, but to a harmonious whole. It is worth noting, however, that Fiat has succeeded in making a successful use of roller bearings for crankshaft and connecting rods where others have met with failure.

Monza Speedway is a very successful attempt to imitate American automobile track racing methods. For the first time in Europe long distance speed tests have been held on a privately owned, completely enclosed track and important cash prizes have been offered to the competitors. For the 122 cu. in. race it is estimated that 150,000 spectators were present, which is by far the biggest number ever gathered together for a European automobile race.

Built in a former royal park, with the Alps as a background, the Monza Speedway has an unusual setting. It really consists of a duplicate of the Indianapolis Speedway, over which is laid a boot shaped track, one forming a continuation of the other, with a couple of parallel straightaways in front of the main stands and an underground and overhead passage. The two tracks form a continuous circuit 6.2 miles round, the track portion only being a little more than 2½ miles round.

The full circuit was used for the opening races, but there is no reason why the small circuit, duplicating Indianapolis, should not be used alone. Over the 6 1/5 mile track Monza is slower than Indianapolis, but the 2½ mile track alone is faster than the Hoosier Speedway. While it is doubtful if the Fiats on Indianapolis Speedway could beat Murphy's record of 94.48 miles, they could certainly equal, if not better, the times made in 1921.

Although Italian automobile manufacturers are not directly interested in the Monza Speedway, they have given complete support to the venture and recognize that the track will give them an advantage in preparing cars for international races.



One of the 8 cylinder, 122 cu. in. Bugatti cars with the driver, Friedrick, at the wheel, With the exception of Viscaya, the Bugattis were forced to remain out of the races by lack of correct gear ratio and wheels

Durant Dealers in California to Celebrate Factory Opening

OAKLAND, Cal., Oct. 2—All the cities around San Francisco Bay have joined forces with the Oakland Chamber of Commerce in the celebration of Oct. 12 as "Durant Day," to honor the official opening of the Durant Motor Co.'s plant in this city. Durant dealers from four Pacific coast states will be here for the celebration, and dealers from virtually every town in California between the Tehachapi Mountains and the northern boundary of the state will drive in from their places of business in Durant cars.

The northern delegation will start at Seattle and pick up the Portland dealers on the way south. The southern delegation will start from San Diego and will be joined by another delegation at Los Angeles. The dealers will hold a sales convention at the Durant factory Oct. 12 and 13. The city will be decorated on the 12th, and there will be concerts, speeches, barbecues and other events on the program.

CALIFORNIA CONVENTION OCT. 16

OAKLAND, Cal., Sept. 29—The annual convention of the California Automobile Trade Assn. will be held Oct. 16 and 17 at Santa Barbara. In addition to a fixed program, it is expected that there will be important discussions of proposed legislation derogatory to the automobile industry. One of the proposed bills to come before the next legislature would exempt one truck and one car in every family from execution. This would mean that a dealer or maintenance shop could not attach or hold a car for a repair bill.

"Tire Selling Is the Easiest Thing in the World"

An Old Timer Gives You the Benefit of His Experience as to the Little Things That Go to Make a Prosperous and Lasting Business

By JOHN ROOKS

IF tire retailing is an art, I am an artist. I have grown up with the tire industry. I was selling and repairing automobile tires when gasoline, real and unadulterated gasoline, was sold to you in a water bucket at 11 cents a gallon. O! those were the good old days, never to come again, in the gasoline line.

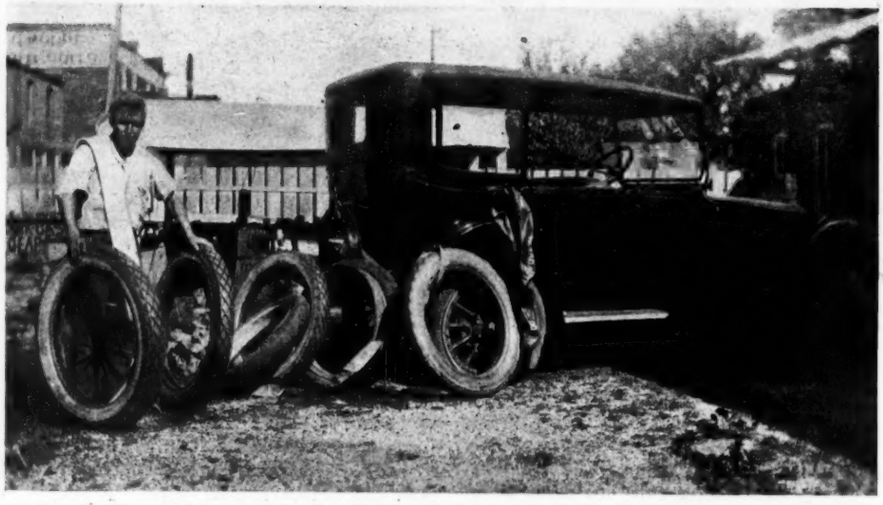
A 30x3½ casing sold for $20, others in proportion, and we charged for the putting on. It's many a brand new tire I have put on and was proud of it, and many a one I have put on and wasn't proud of it. I have seen tires in the beginning of the industry that would run a couple of thousand miles without a blowout or rim cut. I have seen others perfectly new ones, as smooth and as plump as a Georgia peach, swell up in spots when inflated, like a snake full of goose eggs. Who cared? That didn't hurt any in those days, just so long as she stayed clinched.

Everything and every size was clinched and guaranteed, a guarantee as long as the salesman could memorize. That was what sold them, the guarantee. The thicker the guarantee the more the tire cost. You can hear some of the same old talk to this day, in some places, but we of the old school know what it means to say guarantee and have eliminated it from our vocabulary.

The art of tire making has advanced until they are all good, only some are better than others, and you can see more than three hundred different brands of tires on the American market today.

We used to say with pride, as we exhibited one of the three different makes of tires, "this tire is guaranteed for two thousand miles and will cost you $20. Yes, it is a smooth tread and will fit either front or rear wheel." But now, just listen in, this is what we say, and it is every bit the truth, "this tire will run somewhere between seven and 12 thousand miles and will cost you $11.80. Yes, a genuine straight side, heavy cable base, heavy non-skid tread, and we put it on for you." Do you see the difference? With good care one may get as much as 15 or 18 thousand miles out of that tire.

A rusty, straight side rim, the deadly enemy of the tire that goes on it



"In 1902 I could have made a fortune with a tire like this, as a side show attraction"

We always do the putting on nowadays. We would rather knock off a little and put them on than let the customer put them on at full price. Why? Well, years of listening to tire woes have turned tire retailing into a careful study and a master art. I will explain here why we tire retailers should always attach the new tires that we sell, for in attaching lies the life of the tire. We sell two kinds of tires, the clincher and the straight side, but the clincher being the most abused and the most easily damaged, I will take it up first.

I positively refuse to attach a new casing with an old inner tube. I would rather lose the sale, for a new casing will travel anywhere from seven to 15 thousand miles and that old tube he wants you to put in has already traveled a good many thousand. The consequences are that in several thousand more miles the tube develops a leak and out goes the air, and air is the life of a tire, just like food is the life of a man.

You take food from a man and he dies, you take air from a tire and it dies. Did you ever think of it that way? Not only does it die, but it destroys itself while doing so. No use to tell you how, as we are all getting tire wise, but I have seen them that would tear their entire clinch off and then wrap around the axle. I have seen those that would get caught at the valve stem and cut themselves almost in two while the driver, blissfully ignorant, would still step on it. That is only one of the thousands of things that ruin a good casing. Now for a few more.

Watch out when installing a new casing for the little rivets in the rim of the clincher wheels, the ones that hold the iron clip over the ends of the felloes. they will sometimes cut a hole in the tube and you don't know what did it. Then you have another mystery tale for MOTOR AGE or swear the tube was faulty.

Maybe you don't screw the leather cap down on the felloe at the valve stem, the casing fills up with mud and sand and cuts a hole in the tube, of course.

Maybe the wheels are out of alignment. Look at them. Measure the front ones and examine the rear ones. Make sure the fenders don't strike the tires when driving over rough roads. Make sure the tires are about the same size on their respective wheels.

And, above all else, make sure that you have a good rim to put the tire on. If the clinch is bent down on the rim, like a good many of them are, take a ten inch pipe wrench and a small hammer and shape it up. You can do it and do it both easily and quickly with a little practice. When you get it shaped up, smooth it with a file. Call the owner's attention to these things and let him know that you are trying to sell him satisfaction and that you want his co-

operation in the care of the tires.

Tell him not to let his tires sit when muddy, or frozen, until they dry and then drive off with a lot of hard mud sticking along the edge of the rim. That is one way rim cuts start. Scrape, or wash, the tires before starting. And make sure they are full of air. Don't guess at it, test them, and if they are not up to twenty pounds to the inch, put in more air.

Just before you put the air hose on, press down and let a little air out of the tire. That will blow all the sand and dust out of the valve and you will not be bothered with a sticking valve core. Insist on these things and on sliding your tires in starting or stopping and tell him it is for your good as well as his that you ask him to do this.

Whatever pertains to one tire pertains to another, whether it be clincher or straight side. A straight side tire will not rim cut or will it blow off the rim when properly inflated. The most trouble we have with straight side casings is rusty rims. This one thing alone ruins more casings than anything else, except under inflation. A rusty rim is always rough and, of course, cuts the casing where it comes in contact, nearly always cutting into the wire cable. Then your cable rusts and breaks, or the rubber and fabric will tear off the cable. Then your tire blows out and has to be repaired while comparatively new.

As I said before, straight side tires are easier to care for than clincher tires, and I can see the day when there will be no clinchers on the American market and may the day soon come.

Tire selling is the easiest thing in the world. All you have to do is get some one to sell to and if you have a new tire the chances are five to one in your favor. He has four tires on his wheels and should have a spare one attached to his automobile somewhere. But, your price has to be right and your service better. You have to get him to your place of business. You have to attract his attention some way so that he will know that you have a tire. There are a good many ways.

This revolving table is a real aid in straightening straight side rims

First, make sure that you have a nice clean stock of goods, well displayed, not slovenly, and always have the size. Watch your sizes as an old hen watches her chicks. Watch for new customers and never let an old one get away. In getting new customers you may do it in any of the following methods. Some of them I have found very effective.

A good window display is important. Then there is newspaper advertising, hand bills, personal solicitation, demonstrating your tubes by pulling something with them. You will be surprised how much one tube will pull. I fastened two small automobiles together with one and they stayed fastened. That was a good add. Here is another:

Get a bunch of shipping tags, red if you can get them, and have something like this printed on them: "This tire should be replaced with a new——" (give the name of your tire). Then take strings and tie them to the wheels. They attract attention fluttering in the air as the car goes by, besides the message they have printed on them.

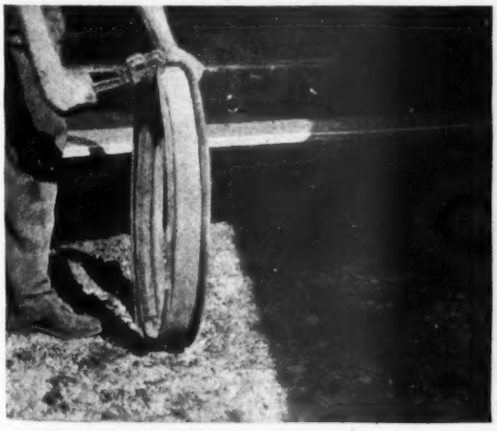
But, of all the ways to advertise, I think personal letters are the best. I have always had the best results with them. I get the names of all the car owners in my immediate vicinity and write them. I write them as often as once a week, making sure that my letters do not go to dead owners, or owners that have moved away. I even watch the auto sales companies and every new car that is sold, that I hear of, I try to sell the new owner a spare, making it a rule to give the owner proof that I know what kind of a car he has and the size tire that he should have. He will not be hard to sell if you go after him in the right way, and that is to be honest with him.

Study honesty in your business. Make it a second nature, for honesty is positively the only thing that will endure in the tire game.

They may get damaged or shop worn, but watch for that and keep your goods new. When I say goods, I mean tires and everything pertaining thereto. For, if you are selling tires you should have a good stock of tire accessories. Don't go to mixing things by handling groceries, or hardware, or something like that. You should have a well equipped repair department in the rear for a well managed tire repair plant will gather in about as many sheckles as the sales department will.

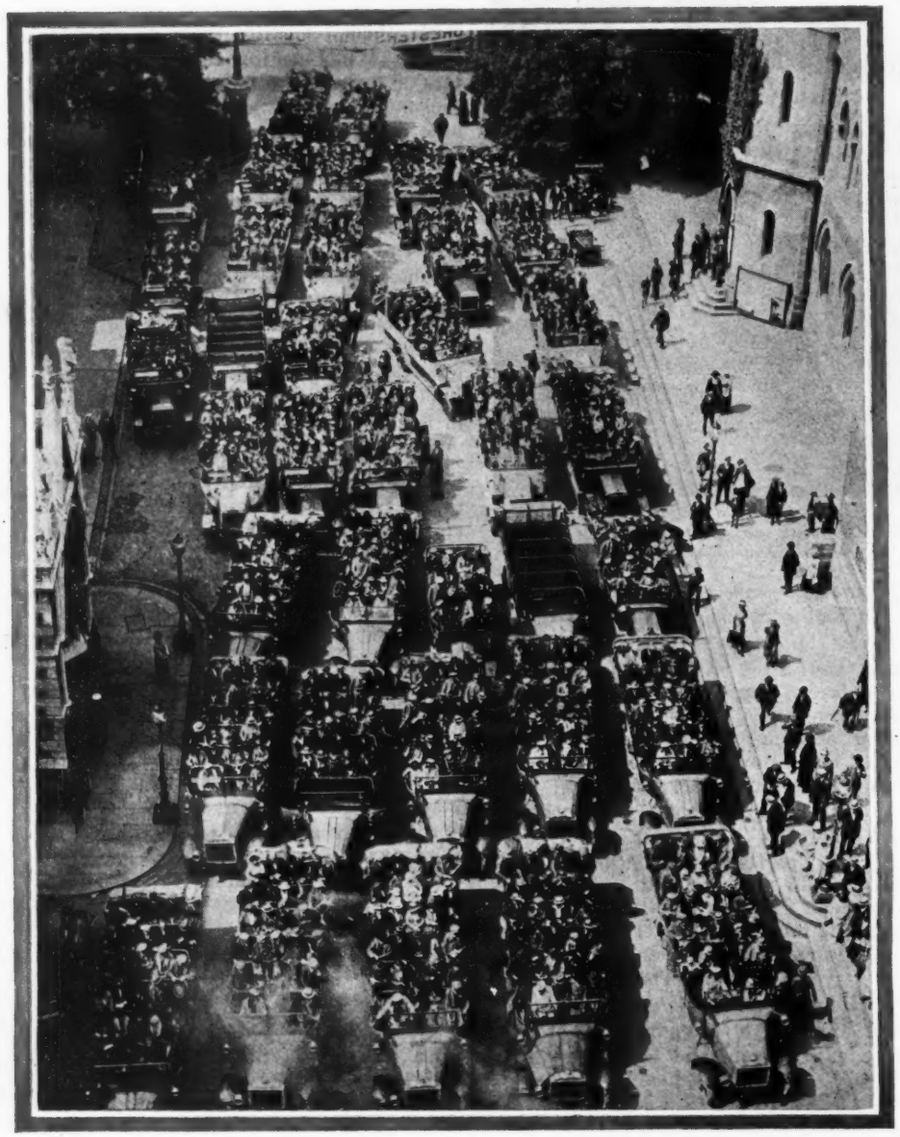
Here are a few things that a tire repair shop should have: Plenty of light and a really good clock, for you should time all your cures,—a tire changer—tire spreader—tire buffer, with a coarse emery wheel on it—a skiver—a nest of tire molds for 3, 3½, 4, 4½ and 5 in. tires—a bunch of hand tools such as rollers, stitcher, probes, scissors and knives.

If there are any trucks in your vicinity get a large truck tire mold, one for the inside and one for the outside of the tire. You will probably need a hand buffer of some kind, as you cannot turn the large tires wrong side out like you can the smaller ones. Order small amounts of repair materials from some good, reliable firm and then get a real tire repair man to use them.



Left: Straightening a rim with a 10 in. pipe wrench. Right: A buffer stand and other stands, made of wood and filled with sand to make them steady and portable, are moved outdoors in hot weather

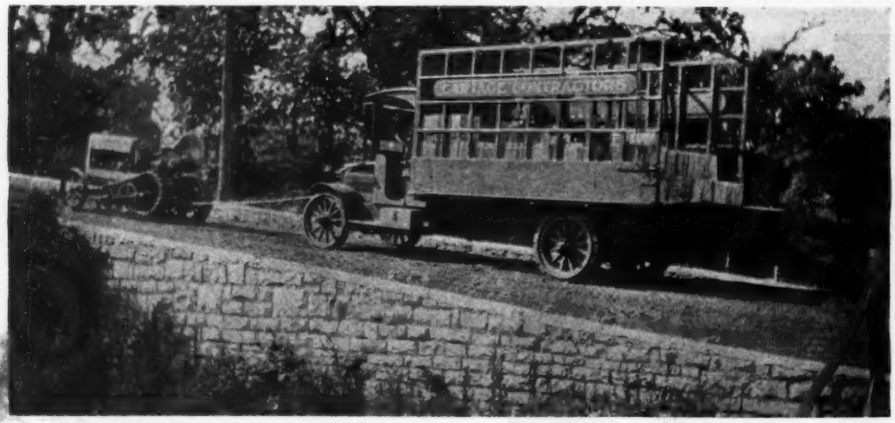
MOTOR AGE'S PICTURE PAGES



Members of the Ancient Order of Foresters in London, England, recently chartered a fleet of busses and made a tour to Dartmoor. The whole fleet is shown here, assembled in Guildhall Square, ready to "sail"

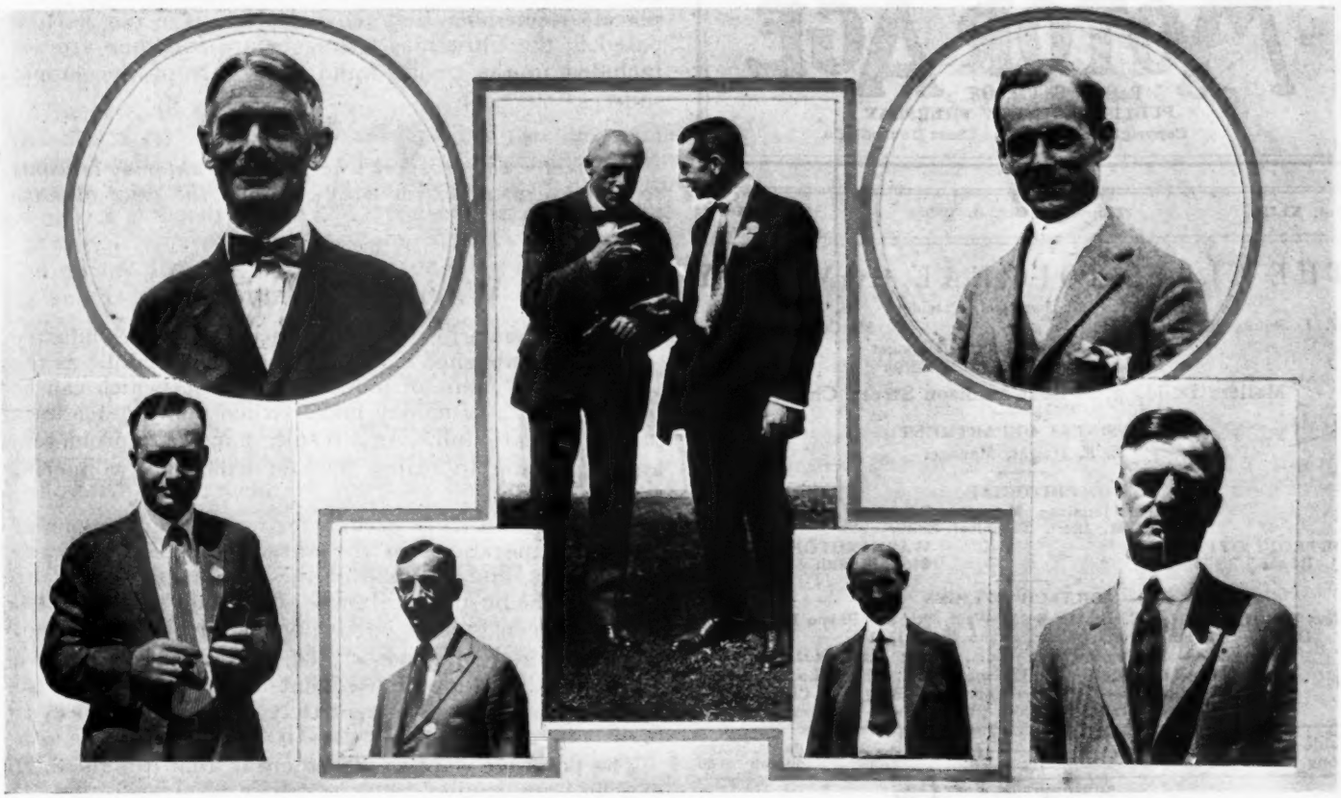
Pietro Bordino, who made the fastest laps in the recent French Grand Prix 2 Liter Race. Bordino drove one of the Fiat Racers

Contenders in the French Grand Prix 2 Liter Race were grouped at the start as shown in this view. Felice Nazzaro, of the Fiat team, is leading the field



At Joliet, Ill., the railroad strike would have completely tied up all industry if trucks had not come to the rescue and kept shipments moving. One firm was hindered by a 40 per cent grade between its plant and the highway, but this difficulty was overcome by hauling the trucks uphill with tractors

OF AUTOMOTIVE INTEREST



These men have been prominent in the engineering development of the internal combustion vehicles. At the upper left hand corner is H. M. Crane, a consulting engineer whose name is on the Crane Simplex car and who has been prominent in aircraft development. Upper right hand corner is B. B. Bachman, president of the Society of Automotive engineers and engineer of the Autocar Co. Center is Elmer Sperry, of the Sperry Gyroscope Co., who has given much time to engine development, and C. M. Manly, identified with both automotive and aircraft work. Lower Row, left to right: Thos. Midgeley, Jr., fuel section of the General Motors staff, with a bottle of his tetra ethyl lead (anti-knock dope); J. V. Whitbeck, of Cleveland Automobile Co. and first vice-president of the S. A. E.; J. G. Vincent, of Packard and former president of S. A. E., designer of Liberty engine; F. A. Bonham, chief of Durant service department. Photos made at S. A. E. Summer session.

One of the posters that will be used by the Red Cross in the annual membership drive from Armistice Day, Nov. 11, until Thanksgiving. Every dealer should help this movement

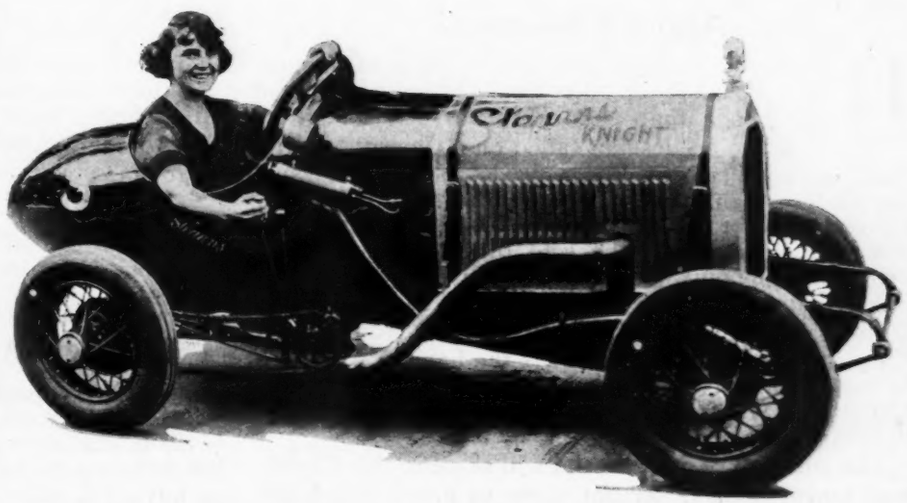


Photo is of Miss Gertrude Sheldon of Milwaukee, who occasionally drives the world's smallest racing car, which has attained the great speed of 68½ miles an hour. The car is equipped with a standard motorcycle engine of twin cylinder type, and has proven its worthiness on many occasions. The car was designed and built by the son of one of the most prominent auto manufacturers in the country, and has attracted wide attention by its trim and speedy design

MOTOR AGE

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About Christmas

HAVE you thought over that Christmas suggestion we made the other day? Have you ordered the goods that you expect to sell for gifts?

Not long ago a salesman called on a Chicago department store to talk Christmas goods and was shown a list of less than a dozen articles that this store was interested in for the Christmas season. This salesman was not surprised and he sold the store one of the articles. The point we wish to make is that the regular Santa Claus stores have already completed their preparations for the Christmas trade and are ready for it. They know it will come, for it is the habit of shoppers to make a wild rush to a department store just before Christmas. This is the habit, and habits are very hard to break.

The automotive dealers who will share in this Christmas business must set out early to break this habit sufficiently to get a place in the selling. He must let people know beforehand that he is going to have gifts for sale. He must get to these people before they join the big shopping rush according to habit. In order to do this, he must decide early what he is going to offer for Christmas selling, so that he can pass the word along to those whom he expects to buy from him.

It certainly is none too early to make out your own buying list, prepare your advertising campaign and begin to let Christmas suggestions appear about your place. Remember that most dealers have not participated in the Christmas selling before and they are not included in the public mind as a part of the supply sources.

The motor car prospect who prices an automobile wants to know what it will actually cost, not the price at some remote point.

Warn Your Friends

THE wonderful revival of the automotive industry has established it in the minds of the public as the most dynamic of industries and one which can be looked upon as a money maker when many other lines of business are dull. As a result, many fake promoters are organizing to reap a harvest from this wonderful reputation.

It is almost a daily occurrence for announcements of news incorporations in the automotive field to reach MOTOR AGE, and we read of the organization of many others in the business columns of the daily papers. Also we have been greatly entertained lately by reading of the conviction of some of the promoters who got a very early start or whose plan of operations was so flagrant as to attract immediately the attention of even foolish investors.

The point we want to make here is, that it is the duty of every automotive dealer to advise his friends and his community generally against investing in these wild ventures. It is true that there are offered for sale at present some very promising automotive securities, and investors should buy these if they are in the financial position. There are also offered many fake stocks for which there is not the slightest chance of success. Too many of these companies are founded on a revolutionary idea that promises to entirely change the automotive business within a few months, or a year at the most.

It is sad to relate that many automotive dealers have in the past bought such stock and have written to MOTOR AGE later, telling about it. Our suggestion is that dealers do not buy any automotive stocks until they have consulted their bankers and that they advise all of their friends to do the same. Most of the money that goes into these fake stocks should go into an honest to goodness car and the dealer should profit.

The used car problem resolves itself into a problem of educating dealers to selling their merchandise at a profit.

Discretion in Buying Equipment

IF a dealer bought all the equipment and machinery which the market now affords for his maintenance shop, the chances are he would have no floor space left to house the customers' cars. There is such a thing as buying a piece of machinery which at first has a strong appeal and afterwards is relegated to some remote part of the shop because, as many shop men have told us, "we don't use it anymore," or "it's too much bother to set up."

A piece of equipment might be handy under certain conditions, but, when adapting it to shops generally, we often find limiting factors which forbid its purchase. A ma-

chine may do a certain operation well and do it more quickly than by other means, but if such an operation is performed only a few times as compared with other shop operations, such a machine will prove a poor investment. It may not pay for itself during all the time it is occupying space in the shop.

Suppose, for example, a machine is brought out which handles a car in much the same manner that an engine stand handles an engine, in other words, a machine which swings a car into almost any conceivable position. Such a device is handy, no doubt, upon certain occasions, as welding frame parts and greasing chassis, but would it be of any advantage in the average large shop handling a hundred or more cars a day, especially in the face of what is being done in some large shops in regard to handling all work on the piece work plan?

The cost of such a machine probably runs into several hundred dollars and the space taken up is about that of a car. Now, if the shop is working on the piece work plan it would mean installing a machine for each mechanic out of justice to the men. It would not be fair to favor one or two men at the expense of the others.

Also, with modern shop layouts, one crew might be working on the powerplant, another taking out the rear axle and others on other parts of the car. Thus, with the car in its normal position, these operations can easily be performed, whereas they would be practically impossible if the car were tilted very much from the normal position.

Care should also be exercised in choosing a lathe, if the shop needs such a machine. There is little use in getting a lathe with many automatic features on it when a conventional lathe will serve every purpose, even though it may take a few minutes longer to set up for an operation or perform the operation itself. The frequency of the operation must determine the type of lathe and some of the overzealous statements of the machine tool salesman should be discounted.

Shop equipment is as great a factor in making maintenance pay as any other single factor. Wherever a machine will serve a purpose it should be bought and the sooner it is bought the better. The only thing to bear in mind is that no one machine will serve equally well in every shop. Local conditions are a guide to intelligent selection and buying of equipment. A few well chosen machines may prove of more use than a dozen machines picked at random. A good shop foreman can be depended upon to select the right equipment because he usually has the best conception of the operations performed in his particular shop.

Courtesy counts in the courts of business these days.

Unworthy Practices

A JOBBER of automotive equipment has sent to MOTOR AGE copies of his correspondence about a customer who refused to accept a shipment of goods "because he did not want them now." Apparently there was no objection to the goods and no dispute about the fact that they were ordered. From all of the correspondence one can only judge that this man changed his mind and left the seller to hold the sack.

This correspondence infers that this jobber has been imposed upon under similar circumstances several times of late. It would seem quite improbable that many dealers would resort to such practices. Such business methods are quite a load for an industry to carry. Unbusiness-like practices on the part of dealers, however small, give the industry a bad name among business people generally.

A dealer should not place an order unless he needs the materials he is ordering. Then he should accept the stock unless for a reason that is good enough to be repeated to his associate in that business deal, the man from whom he buys. A contract is a contract.

The dealer who quarrels with his factory over routine is putting himself in an attitude that will cost him profits later.

Association Activities

THE Automobile Courtesy Campaign of the Chicago Automobile Trades Association is making headway and is interesting more and more car owners in good traffic conditions daily.

Even more important than that, it is attracting attention to the fact that the automotive dealers of the city are interested in something more than the sale of the car. It lends to the belief that the dealers as a body are in favor of the decent use of a car.

Another recent discovery of this association is interesting. Many newspapers are shutting down on publicity for any certain make car, but all newspapers like to print the proper kind of material about automobiles and the automobile business. So the publicity department of this association sends out occasionally interviews with the president of the Chicago association about Chicago automotive conditions. Local papers are quite glad to get this information, as shown by the use of it. This publicity is beneficial to all car dealers alike.

Both of these suggestions drawn from the activities of the Chicago Automotive Trades Association are recommended to local associations everywhere.

Can you talk of a rival car without "knocking it?"

"Show Week" Suggestion

HERE is one argument in favor of a "Show Week," or whatever name may designate any certain week for the showing of motor cars under special conditions by all dealers of a city, that does not always receive the consideration that it deserves.

Many persons who are doubtful about their ability to buy a car often look longingly through the windows of a salesroom and wish that they could enter and examine the cars more closely than they are able to from the outside. The reason they do not walk in is, as a rule, that the salesroom is quite an imposing place, comparatively few persons enter it and the likely prospect fears that he or she will be the subject of too much attention, will be forced to give his name and then will be subjected to repeated calls on the phone or from salesmen.

This is an actual bar to many persons, and if there is a certain period when this likely prospect can see crowds going into these salesrooms and they are assured that they will not be embarrassed with individual sales attention, many of them will go, ask questions, become actually interested and finally permit their names to go in the prospect file.

A special "show week," with the cars on display in the showrooms where they belong, is an excellent thing if the invitation is issued in the right spirit and the spirit then observed.

N. A. C. C. Renews Fight on Excise Tax

Appeals to Congressmen to Kill Levy on Cars and Parts

Total Cost to Owners of Automotive Vehicles in 1921 Was More Than $117,322,000

WASHINGTON, Oct. 2—The repeal of the discriminatory war excise tax laws of 1918 and 1921 will be sought by the National Automobile Chamber of Commerce in a campaign, launched here, placing facts and figures before Congress, setting forth the Chamber's argument as to why the laws should be repealed and citing the present inequalities of the existing law.

The opening "guns" of the Chamber are being trained on the members of the House, Senate and more than 1,000 nominees for seats in these two bodies.

In a letter, carefully planned by the Taxation Committee of the N. A. C. C. of which C. C. Hanch is chairman, aspirants for Congress and those already in office are asked one question:

"Are you in favor of the repeal of all discriminatory war excise taxes?"

Continuing, the Letter States:

"The desire of Congress to repeal discriminatory war excise taxes was definitely indicated in amending the 1918 Federal tax law by removing such taxes on some articles and reducing them on others. In no case did Congress increase such taxes or add new ones.

"Apparently Congress believed it of greater importance to relieve musical instruments, sporting goods, chewing gum, thermos bottles, fur articles, picture frames, perfumes, toilet waters and hair dyes, than individual transportation. In this belief we do not concur, and we feel that the only equitable thing in the interests of fair play and the welfare of all industry as a whole, is to repeal all discriminatory war excise taxes."

The Chamber's letter closes with the request that the addressee favor the Chamber with his opinion on the subject. The letter makes it clear that the automobile industry is not seeking any special privileges for itself as an industry but is merely seeking fair taxation on all industry and not the elimination of taxation on certain classes while others must continue to pay the excise taxes.

Under the existing law, section 900 levies a tax of three per cent on all automobile trucks, tires, parts, and accessories and five per cent on all other automobiles, tires, parts and accessories.

The law of 1921, repealing in part the law of 1918, relieves manufacturers of musical instruments, sporting goods, chewing gum, thermos bottles, toilet soaps, toilet powders, picture frames, motion picture films, perfumes, toilet water, hair dyes, patent medicines and ice cream from payment of the excise taxes. This, the Chamber points out, is unfair discrimination against the manufacturers of other, and in the majority of cases, more useful commodities.

Just what the excise tax means to the automobile industry is seen in the light of government reports showing that owners of motor vehicles paid into the Federal treasury in 1921 a total of $117,322,000 in excise tax alone, in addition to $212,978,000 in the way of state taxes and $11,000,000 in municipal taxes, or a total of $341,300,000 taxes for the year.

Accompanying the letter and extract of the war excise tax laws of 1918 and 1921 is a vest pocket story of the motor vehicle showing the census of automobiles by states, the amount of raw materials consumed in manufacturing automobiles and the number of workers employed in the automobile industry.

Success for the campaign against the existing law, it is believed by the Taxation Committee of the N. A. C. C., can best be courted by making the broad general appeal for the removal of all excise taxes and it was decided at the concluding meeting of the Committee in New York on September 6-7 that the policy would be pursued that was adopted, thus leaving the way open for the support of other industries who feel that they are entitled to a measure of relief from war and post-war legislation.

Plants Near Chicago Close for Short Period of Time

CHICAGO, Sept. 30—Two automobile factories in the territory surrounding Chicago have been shut down for short periods recently. The R. & V. Knight plant at Moline, Ill., was closed because the acuteness of the railroad shopmen's strike interfered with obtaining materials. It has now resumed operation. The Mitchell plant at Racine, Wis., closed for inventory and cleaning up some factory details, but expects to resume Oct. 2.

The Ford Motor Co.'s Chicago branch has returned to its normal schedule of assembling 250 cars a day. Diamond T truck factory is operating on a fair schedule, finding an increasing demand for trucks in Chicago and other large cities but very little demand from the small towns and farms. This company this week inaugurated a policy of giving every truck produced a 30-mile test under full load before permitting it to leave the factory.

STAR'S BEST TIRE MONTHS

AKRON, O., Sept. 30—Production and sales of the Star Rubber Co. for July and August are far ahead of any other 60 day period in the company's history, according to R. G. Shirk, assistant sales manager.

Shortage of Freight Cars Causes Difficulties in Shipping

Congestion in Lake Boat Traffic Adds to Distributing Troubles

DETROIT, Oct. 2—Shortage of freight cars and congestion of shipping on the lake boats is causing factories considerable difficulty in shipping automobiles and is adding daily to the number of cars that must be driven to dealers. One company has gone to the extreme of notifying all distributors within 1,000 miles of the factory to plan for driveaways on all cars required in the next 90 days.

The freight car shortage is more acute in the adjoining cities to Detroit than in Detroit itself, but even here shipments are being held up for several days to get shipping accommodations. There is almost a complete dearth of the big automobile cars, and companies making shipments to the coast are compelled to resort in a great many instances to cars holding only three automobiles as compared to five in the larger cars. This is entailing an additional burden to the already high cost of coast shipments.

Congestion in the Cincinnati railroad terminals is causing many factories to advise dealers in districts reached through Cincinnati to arrange for driveaways where cars are required quickly. Congestion in eastern shipments is also marked and many delays are ensuing in getting cars through to cities in New England and along the Atlantic seaboard. This condition is made worse by the difficulty in obtaining space on the Buffalo boats. Independent boat companies are helping out somewhat, but infrequent sailings make this meager at best.

Because of delays in getting cars on the boats, distributors and dealers are compelled to hold their driveway crews for days at a time in Buffalo and Chicago and in an increasing number of cases the crews are coming through to Detroit and making the driveaway over the entire distance. Permanent driving staffs will be formed by many distributors for several months at least.

UNIFORM LAW CONFERENCE

BOSTON, Sept. 28—Two committees were appointed at the conference of motor vehicle registrars held here to go over uniform law matters. Frank A. Goodwin of Massachusetts, Bert Lord of New York and Benjamin Eayon of Pennsylvania were the three to adopt formulas for tail lamps. For uniform hand signals Robbins Streikel of Connecticut, Goodwin and Eayon comprise the committee. There were representatives present from Maine, New Hampshire, Vermont, Massachusetts, Connecticut, New Jersey, New York and Pennsylvania.

Chicago to Have Big, New Motor Bus System

Yellow Cab Head Buys Bus Company and Will Reorganize

CHICAGO, Oct. 2—Coincident with the shelving by the City Council of Mayor Thompson's project to spend $3,000,000 for municipal busses, it is announced by John Hertz, president of the Yellow Cab Manufacturing Co., that he and associates have purchased the stock of the Chicago Motor Bus Co., and that they are planning a vast extension of the bus system to include all the city's boulevards. At present, the company operates only one line, to the north side over Michigan boulevard and Sheridan road.

The new company, which will be capitalized at about $3,000,000, will scrap all but six of the busses now in operation and will install new busses embodying all the most modern features for the convenience and comfort of the passengers, Hertz said. Eventually, he expects to use 250 or more of these busses on the city's boulevards. Permission will be asked at once from the Illinois Commerce Commission and city park boards to install the new bus lines.

Hertz said it had not yet been decided where the new busses will be built, but that an announcement in this connection probably would be ready in two weeks. The probability that the new busses will be manufactured by the Yellow Cab Manufacturing Co., is being widely discussed. It is known that for some time, officials of the Yellow Cab Manufacturing Co. have been making a study of bus construction and operation and that plans have been considered for adding to the company's factory.

It is probable that if the busses are manufactured by the cab company, a new plant will be erected for that purpose. The present factory facilities are said to be taxed to capacity by the production of 400 Yellow cabs a month, the market for which is increasing steadily.

Although Hertz expressly announced that the new bus company will not in any way be connected with the Yellow Cab Co., operators of Yellow cabs, of which he is also president, it is expected that he will apply to the bus company the same principles of efficient and economical operation which have made the various Yellow Cab companies so phenomenally successful. "The finest bus service in the world for Chicago" is the way Hertz describes his objective. He also has in mind a reduction from the present 10-cent fare as soon as conditions warrant.

SUCCESSFUL CINCINNATI SHOW

CLEVELAND, Sept. 30—The enclosed car show which was held in the municipal auditorium Sept. 18 to 28 under auspices of the Cleveland Manufacturers and Dealers' Association, brought results that could not have been obtained with individual efforts, says Herbert Buckman, secretary of the association.

Exhibitors sold approximately 200 cars, some of them touring, but mostly the enclosed models, during the ten days that the show was in progress. The patronage was not limited to any particular line, the larger and more expensive makes going as freely as the smaller and less expensive ones.

200 "Gasoline Farming" Teachers Wanted

BERKELEY, Cal., Sept. 30—Men who understand tractors are wanted badly by the College of Agriculture of the University of California, which has 200 positions as teachers of "gasoline farming," in high and junior high schools in California, to fill within a year. Salaries begin at $2400 a year for nine months' work. Applicants must be farm-reared, agricultural college graduates, who can operate and maintain tractors. The university is totally unable to meet the demand for trained farm mechanics as teachers, according to Prof. Thomas F. Hunt, dean of the College of Agriculture.

CHANGES IN JORDAN MODELS

CLEVELAND, Sept. 30—Jordan Motor Car Co. announces a reduction of $300 in the prices of its brougham and sedan, the drop being from $2785 to $2485. No change has been made in the lists on the open models.

Several slight changes have been made in both these enclosed models. The sharp corner lines have been changed to a broomstick radius, roof lines have been lowered two in., and the seats dropped a corresponding amount. The rear seats are wider and the pitch changed slightly. Both bodies are now trimmed in Windsor weave cloth. In the brougham this cloth is worked in plain trim without pleats but in the sedan pleats are used.

A worm type regulator replaces chains in the doors, while removable panels make it easy to get at the regulators. Platinum finish hardware is used in dome lights, door pulls and regulator handles. A new steering wheel with walnut spider and rim, similar to that used on the new Blue Boy, is standard on both enclosed jobs, with polished aluminum control levers mounted in the center.

The sedan body has been lengthened to allow more room in the front compartment and a little more in the tonneau. A large trunk has been mounted on the rear of the brougham, carrying two large suit cases and having an extra compartment for packages.

OKLAHOMA CITY DEALERS ELECT

OKLAHOMA CITY, Sept. 30—At the annual meeting of the Oklahoma City Motor Dealers' Assn. the following officers were elected: President, E. L. Howard of the McDaniel Auto Company; vice-president, S. L. Lindsey; treasurer, Henry Lewis; secretary, Edgar T. Bell.

September Production Is Less Than That of August

Figures Not Yet Available, But Decline Probably Not as Great As a Year Ago

NEW YORK, Oct. 2—September, doubtless will show a falling off from the high mark established in August when a total output of 272,000 cars and trucks placed the month second in the production history of the industry. It is not likely, however, that the decline will be as great as a year ago when September showed a reduction of 12 per cent from the previous month.

A short month, during which there was a holiday, and the temporary shut down of the Ford factories will prove the chief contributing factors in the expected decline, although a decrease in sales, somewhat more noticeable during the last few days, has had its effect upon factory operations.

The year has borne up exceptionally well, with the seasonal decline in sales beginning 30 days later than usual and then in no serious volume. That the tapering off in demand has not come earlier is one of the surprising features of a year that has been notable for its consistently high production records each month. The curtailment of factory schedules, slight as it may prove, merely follows the policy of the manufacturers to produce only enough cars to meet the actual demand and to refrain from piling up inventories of finished models either in the factories or on the dealers' floors.

Farmer demand is centering in the lower priced cars which are benefitting from aggressive sales campaigns. Manufacturers of the medium and high priced cars are centralizing their efforts in rural sections along the seaboards and in districts where the harvest has been most satisfactory.

The coal situation has proved of particular benefit to the sale of light delivery trucks for which there appears a remarkably good demand.

FLAT RATE IN SAN FRANCISCO

SAN FRANCISCO, Sept. 30—Motor car dealers in San Francisco are adopting as rapidly as possible the flat rate system for repairs in co-operation with their factories. Butler-Veitch Co., Marmon distributors, is one of the leaders in the movement. Nearly 300 operations are figured on their flat-rate schedule.

CADILLAC SHOW AT BOSTON

BOSTON, Sept. 28—Surrounded by decorations running into the thousands of dollars, and with a real autumn aspect to the salesrooms, the Cadillac Automobile Company of Boston staged its 11th annual Closed Car Salon this week. It now has become one of the features of Boston's Motor Row, and each year attracts many visitors.

Chicago Dealers to Stage Seasonal Displays of Cars

Automobile Trade Association Helps in Move for Individual "Shows"

CHICAGO, Sept. 30—A concerted showing of new models of enclosed cars, with attractive seasonal decorative settings, will be made in the salesrooms of all dealers affiliated with the Chicago Automobile Trade Association from Oct. 14 to 22, inclusive. This was decided at a special meeting of the association this week at which $18,000 was appropriated to advertise the show.

This will be the first time that Chicago dealers have conducted a special display simultaneously in their stores and under the general direction of the trade association. Desire to hold an enclosed car show was universal among the dealers, but some were of the opinion that it should be held in the Coliseum or other central place. The question was thoroughly discussed by all the dealers attending the meeting before a decision was reached. The chief arguments in favor of the salesroom show were that each dealer would have room to display all his models, the salesmen would feel more at ease in their own place of business and the visitors would be in a more receptive mood than in a combined showroom. The final vote was unanimous for the salesroom show.

A number of dealers and distributors, co-operating with their factories in national movements, have already held or are planning to hold individual enclosed car displays, but all of these promised to continue or repeat their shows in connection with the trade association's undertaking. The salesroom show is to include not only the dealers along the Michigan boulevard automobile row, but also in the outlying sections.

ELECTRIC VEHICLE SHOW

CHICAGO, Sept. 30—The second annual Chicago show of electric vehicles was held this week in the downtown showrooms of the Commonwealth Edison Co. Five makes of trucks and three makes of passenger cars were exhibited. Accessories and equipment also were displayed.

Considerable interest was shown in the electric trucks, for which a wide market is said to be developing in this and other large cities. A representative of one make of truck manufactured in Chicago said that some large firms are operating fleets of as many as 200 electric trucks and buying more regularly. Among the large customers are laundries, bakeries, ice cream manufacturers and express companies.

Packard Earnings Are Increased to $6,000,000

DETROIT, Sept. 28—Since the inception of quantity shipments on the single-six model in May this year, the Packard Motor Car Co. reports that earnings have increased to a point where they are now at an annual rate of about $6,000,000. This is reported equivalent, after all disbursements, to about $2.85 a share on the 1,188,510 shares of $10 par common stock outstanding, or about three times the annual 10 per cent dividend requirement. The cash balance is now about $16,000,000, an increase of $7,000,000 since Jan. 1.

Capacity operation is planned through the winter. Present production is reported to approximate 2,100 vehicles monthly, including light six, twin and truck models. This production will be increased, the factory having capacity for 3,000 monthly. No interference is expected from strike conditions, the company having a coal surplus ample for several months' requirements. The company is prepared to use trucks to bring in supplies of material if necessary.

CADILLAC ENCLOSED CAR WEEK

DETROIT, Sept. 29—A national enclosed car week was held by Cadillac distributors and dealers the week of Sept. 17 to 23. The idea was advanced by H. H. Rice, president of the Cadillac Motor Car Co., at the distributors' meeting recently held at the factory.

Busses and Automobiles Are Cause of Decreasing Rail Rate

Passengers Carried This Year Lower Than for Some Time Past

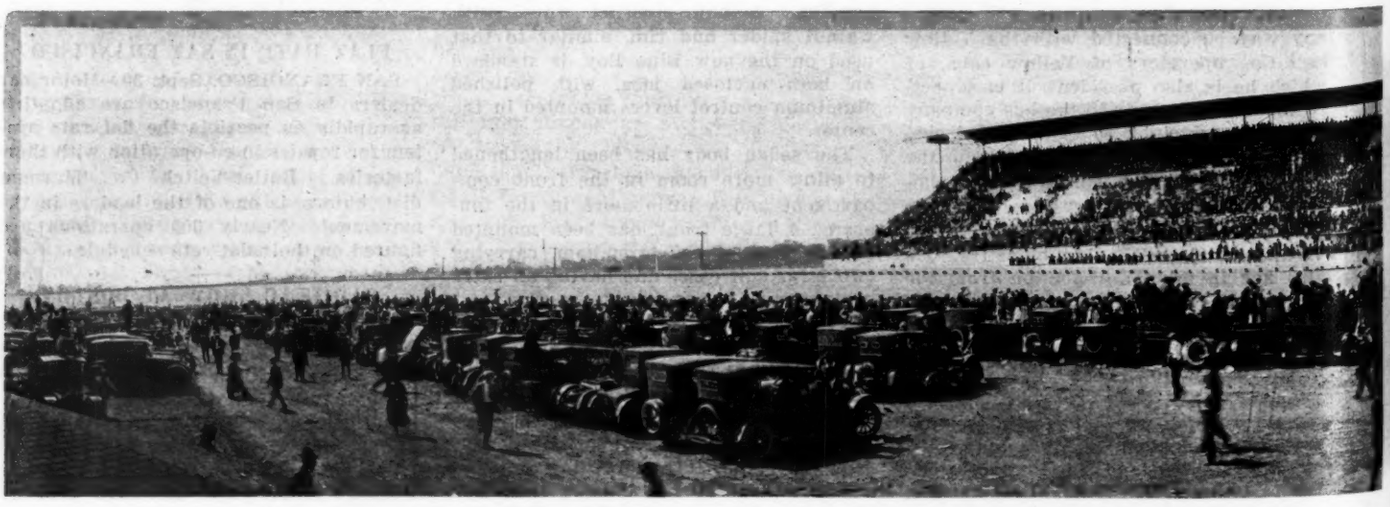
WASHINGTON, Oct. 2—The most direct cause for the falling off in passenger traffic on railroads has been due to the new and growing competition of hundreds of motor bus lines which have been built up in every state in the union, and the millions of privately owned automobiles, declared C. A. Fox, chairman of the Central Passenger Association, representing 166 railroads, in the course of cross-examination before the Interstate Commerce Commission. This testimony was given in the hearing on the proposed interchangeable mileage plan which is vigorously opposed by the railroads and as strongly supported by the travelers' organizations.

"The fares of the bus lines are in some cases lower and in other cases they are the same or higher than the rail fares," said Fox, "but, regardless thereof, they are a controlling factor in handling this short-haul traffic for the reason they pick up and deliver passengers, taking them from the main streets of the originating points to the main streets at destinations, and the service is so frequent that it diverts traffic from the rail carriers.

"Millions of individually owned motor cars also make inroads on the local and through traffic of the carriers, which has been lost for some time.

"Instead of any prospective alleviation of these difficulties, the losses from these causes undoubtedly will continue to grow because of the vast amount of money being expended in every state in the union in the improvement of the public roads.

"For these reasons it is not believed a reduction in fares by means of reduced rate mileage or scrip tickets would restore to the rail carriers any considerable volume of this traffic handled by bus lines or privately owned automobiles.



Opening race, new Kansas City Speedway, Sept. 17. The 300-mile race was won by Tommy Milton, driving a Leach Special, in 2 hrs.

California Dealers Organize For Action on Legislation

Automotive Conference Represents Car and Truck Retailers and Commercial Users

LOS ANGELES, Sept. 30—In order to bring about a plan for concentrated effort in legislative matters there has been organized in this state what is known as the California Automotive Conference. This conference is composed of the following seven units: Passenger car dealers, truck dealers, franchised freight haulers, franchised passenger haulers, individual truck owners, fleet owners and motor draymen. Each unit has its committee with a chairman, who is alone empowered to vote.

The conference has been organized for the sole purpose of uniting the interests concernced upon proposed changes in the state motor vehicle laws. In the past when changes have been advocated or opposed the legislature has had to listen to claims from so many different sources that nothing but confusion resulted. When candidates for legislative office this year were approached, they stated their willingness to help the industry if it were united on a definite plan. Numerous problems are involved and to date the conference has held five meetings in the effort to smooth out the difficulties. It was agreed among the various units that whatever decision was reached as advisable for the majority, all would support. This will result in a very much simplified procedure before the legislature, which convenes in January.

More strict enforcement of motor vehicle laws is desired. California officials have claimed their laxity in enforcement has been due to inadequate funds. One of the proposals in the tentative platform of the conference provides for a charge of fifty cents for each motor vehicle operator's license. No claim is advanced that a motorist should be required to pay for the privilege of driving a car any more than a clerk should pay for the privilege of selling hats, but the idea is to create a fund from the operator's license tax which would be used exclusively in the enforcement of the provisions of the motor vehicle act. A fifty cent operator's license in this state would raise approximately $400,000 and it is believed that with this sum an adequate patrol and enforcement system could be created and maintained.

Another one of the most important problems the conference is seeking to solve has to do with the tax on owners of motor stage and freight lines. At present these lines are taxed on their personal property value and as motor vehicles by the state. They also are required to pay business taxes or a special levy by almost every municipality into which or through which their lines pass. In some instances this multiplicity of taxes is said to amount to as much as 14 per cent on the total investment. The Automotive Conference now has under investigation and may go on record as advocating an amendment to the state constitution, which would provide that these lines be taxed a certain percentage of their gross revenue in lieu of all other taxes.

CALIFORNIA SECRETARIES MEET

OAKLAND, Cal., Sept. 29—Secretaries and managers of the local automobile trade associations affiliated with the California Automobile Trade Assn. held a meeting early this month at the summer home of Geo. Haberfelde in the Kern mountains. Fifteen secretaries were present, among them being Geo. Haberfelde, W. J. Haberfelde, Harry Leonard, Jim Granger, Arthur D'Ettel, Walter Biddick, L. H. Bennett, Otis Hymer, Dick Ingvolstad, A. F. Morris, Robert W. Martland and Geo. Elliot.

Lynn Shaw, assistant manager of the National Automobile Dealers' Assn., explained the "one of a 1000" membership program of the association.

U. S. Bureau of Roads to Teach Their Construction

Maintenance of Public Highways Also to Be Made Feature of Exhibits

WASHINGTON, Sept. 30—The lessons of good roads, their construction and maintenance, will be taught by the U. S. Bureau of Public Roads by means of model road and bridge exhibits on which the engineers of the bureau are now working and will soon have completed.

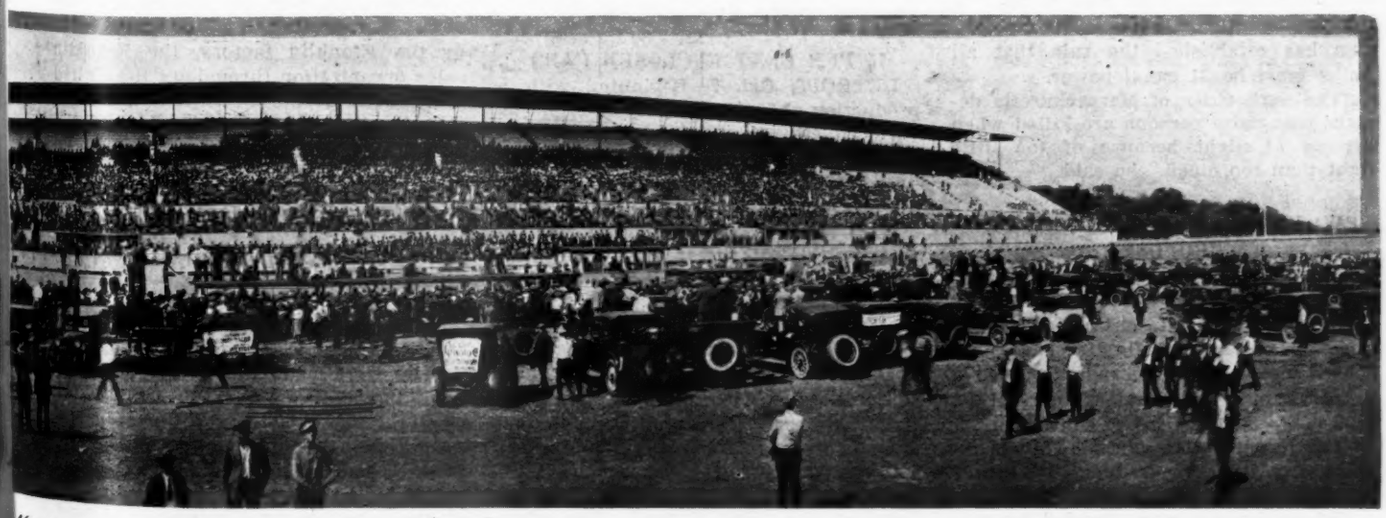
Twelve such miniature models of roads and bridges will be built to show their compositions. These models will be sent, free of cost, to colleges, universities and technical schools, as well as state and county fairs.

The road models are so designed as to show each step in the construction of the road from the compact subgrade to the finished surface. The bridge models are designed to show the relation of the structure to its foundation and the details of the bridge construction.

The exhibits will be in character and sizes similar to the rubber exhibits which will shortly be released by the U. S. Highway Education Board, showing the composit parts of tire manufacturing and materials used, and will also be similar to the exhibits which the N. A. C. C. expect soon to have available for similar study, thus linking up the three exhibits —good roads, automobiles, and tires—so as to accurately and forceably demonstrate the advantages of highways and the automotive industry.

GASOLINE INQUIRY POSTPONED

WASHINGTON, Sept. 28—The subcommittee of the Senate Committee on Manufacturers, which is investigating the gasoline situation, will postpone further hearings until the reconvening of the new session of congress in December, it has been announced by Senator LaFollette, chairman.



46 min. and 52 sec. An unfortunate incident of this race was the accident in which Roscoe Sarles was killed, and a number of others hurt

Proposal to Have Garages Test Headlights in New York

Methods of Enforcing Anti-Glare Regulations Discussed Before Tax Commission

ALBANY, N. Y., Sept. 30—Hearings on the show cause orders why state approval, granted in the past to more than 70 anti-glare automobile headlight devices, should not be revoked was begun here before Judge Walter H. Knapp, of the state tax commission.

Several methods of enforcing anti-glare headlight regulations, under the new state law, were discussed. Suggestions made included a greatly increased state police force especially trained, establishment of state testing stations and licensing of reputable garages passing required tests to aid car owners in testing and adjusting their headlight lenses and devices.

Garages came in for criticism as the "worst violators in the state" by Herbert W. Baker of the New York State Automobile Association. Judge Knapp put forward as a possibility in enforcing the law the licensing by the state of reputable garages to examine car owners' lenses and devices and issue certificates for a small fee, to the effect that they comply with the state regulations, which certificates would be attached to the application for motor vehicle license.

"I have no faith in any certificate any garage would give," said Baker. "They are the worst violators in the state."

Ninety per cent of the drivers in the state are desirous of "doing right" insofar as their headlights are concerned, according to Judge Knapp, but the difficulty is the ignorance of just how to comply with the regulations. For this reason, he said, the tax commission is trying to undertake a campaign of information as soon as the approved list is finally established.

One of the important features of the question which has been approached by the commission, Judge Knapp said, is the candlepower of bulbs. The commission has established the rule that all bulbs must be 21 candlepower.

"The authorities of Massachusetts declare that more persons are killed when driving at night because of too little light than too much," he said.

NEW YORK STATE ORGANIZATION PROPOSED

NEW YORK, Sept. 30—Dealers and dealer association representatives of seven New York state cities met here as guests of the Automobile Merchants' Association of New York and discussed a proposal for a state dealers' association. It was decided to call a convention of dealers in Albany, Nov. 9 and 10, when a decision will be reached as to whether such an association should be formed.

The conference was attended by representatives from New York, Brooklyn, Buffalo, Syracuse, Poughkeepsie, Utica and Binghampton. C. W. Bull of Syracuse, acted as chairman of the meeting which was called by Thomas F. Moore, secretary of the New York association.

Club Buys Busses to Carry Children to School

BIRMINGHAM, Ala., Oct. 2—The Rotary Club of Aberdeen, Miss., has started a movement in that section that it is believed will have a widespread effect on the school systems using motor transport systems.

This club has purchased two large Reo school busses and donated them to the schools of Aberdeen and Monroe County, Miss. They will be used in transporting children to and from school. This is considered as only a starter as there are 4900 school children in the Aberdeen school district, alone.

ACCESSORY SALES INCREASE

NEW YORK, Oct. 1—Reports from members of the Motor and Accessory Manufacturers' Association show that sales of materials in August, 1922, were 5 per cent better than July and that for the first eight months of this year the total sales amounted to $271,555,370 or $112,058,516 more than for the corresponding period of 1921. Collections are 8.21 per cent slower than in July as is shown by the past due column, which reports $3,705,000, while notes outstanding total $2,398,350 or 8.15 per cent more than in July.

NEW PEERLESS DEALERS

CLEVELAND, Oct. 2—The Lifesey Smith Hill Co., Atlanta, Ga.; Miller Motor Car Co., Dallas, Tex.; Colorado Motor Sales Co., Denver, Col.; A. P. Sullivan & Co., Houston, Tex.; Robbinson Motor Co., Jacksonville, Fla.; Harold Johnson, Louisville, Ky.; Greenville Peerless Co., Greenville, S. C., and Ledoux Jannings, Ltd., Montreal, Can., are distributors added since the new Peerless models were announced.

75 PER CENT ENCLOSED CARS

DETROIT, Oct. 2—Beginning with a production of 50 per cent of its output as enclosed cars the Rickenbacker factory has gradually increased this proportion until last month when 75 per cent of the production was enclosed cars. Factory executives are said to be considering increasing this proportion to 85 per cent.

"FLAT RATES" BEAT "PIRATE PARTS"

NEW YORK, Sept. 30—The third annual outing and clam bake of the Automotive Service Association of New York was held at Glenwood-on-the-Sound, Long Island, Sept. 24. A baseball game between two teams picked from the membership resulted in a score of 13 to 7 in favor of the "Flat Rates." The other team was called "Pirate Parts."

September Keeps Pace With Previous Months in Wisconsin

Rural Districts Even Approach Records of May and April

MILWAUKEE, Wis., Oct. 2—September held its own in volume of sales compared with August in the cities, while in the rural districts, reports show, retail trade was heavier and approached the April and May volume. In the centers of population there was evidence that the ranks of prospects have been thinned out by the remarkable selling movement of the last six months, but encouragement is lent by the recovery of trade in September in comparison with July.

Further price reductions announced by manufacturers in the past week or two appear to have upset the public mind to the extent of producing speculation as to when the end of the decline will come. While some prospects have accepted the latest cuts as satisfactory and made purchases which have been in abeyance for some time past, others still cannot be convinced that this is the time to buy. It seems to be quite generally agreed that one or two announcements from factories that prices have been advanced under pressure of higher material and labor costs will have the effect of bringing into the market a good many buyers who at present are wholly at sea.

In several lines of medium-priced passenger cars which lead their respective classes in volume of production, dealers are unable to get the requisite number of cars to fill current orders and are sending men to the factories as often as several times a week to pick up as many cars to drive away as they can possibly squeeze out. This refers to roadsters and phaetons as well as to enclosed types, on which these dealers are anywhere from 30 to 90 days behind on orders.

SEDAN WEEK FOR FRANKLIN

SYRACUSE, Sept. 30—During the week of Oct. 8, according to notice issued today by the Franklin factory, the Franklin sales organization throughout the United States will devote its entire efforts to the showing and demonstrating of the sedan.

Today over 50 per cent of the entire production of the Franklin factory is sedans. In some of the large cities, the sale of Franklin sedans has risen to almost 90 per cent of the total sales.

NEW WESTCOTT BROUGHAM

SPRINGFIELD, O., Oct. 2—First deliveries were made during the past week from the plant of The Westcott Motor Car Co., of a new type of enclosed car, the four-passenger brougham. This car, which is somewhat smaller and more compactly built than a sedan, is proving one of the season's most popular enclosed models.

Some Detroit Factories Cut Schedules 20 to 50 Per Cent

Demand Continues Strong, However, for Cars in Low and High Price Fields

DETROIT, Sept. 30—As a result of a gradual falling off in business from industrial districts, the automobile industry is tapering off in its production, this being especially true in the middle-priced field.

In the high-priced and low-priced cars there continues to be a large volume of buying, and in at least two cases in the middle priced the buying is still around the capacity of earlier peak months. The dropping off in production figures which will be visualized in the September reports will represent losses which have been sustained by the smaller companies in the medium-priced field, the leaders continuing to hold a large share of early business.

In every factory, however, there has been a lessening of production and a laying off of employes. Companies in the high-priced fields which have declared themselves sold to the first of the year are laying off men in small numbers. Schedules in medium-priced cars generally have dropped from 20 to 50 per cent.

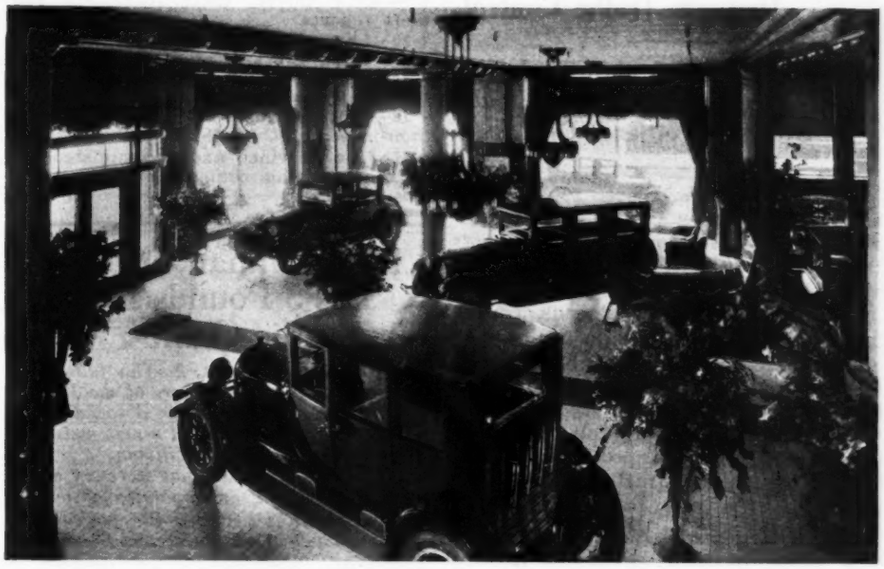
Factory sales managers are turning their efforts toward the cities on both seaboards and the middle west and the southwestern section of the country to sustain operations on a sizable scale during the fall and winter. Most of the buying in farm districts aside from the southeast is in low-priced cars, due to the low yield to the farmer. Substantial farmers are expected to come into the market in the spring when prices are satisfactory.

Truck factories are finding the largest volume of business in light trucks, but this demand, too, is coming largely from cities. The coal situation has created a market for light trucks, which manufacturers are urging their dealers to follow up. Much of the domestic coal during the winter will be sold in small quantities, making a definite market for the small, speedy delivery vehicles. With practically all business on a smaller scale than usual, light trucks are meeting most of the requirements for the present.

Companies coming more recently into production are enjoying a large measure of business and are finding little difficulty in signing up dealers and distributors. New dealers and new models are responsible in no small measure for the volume of business in the summer months and are continuing to sustain it now. Sales of enclosed cars involving a trade-in of an open car present a particularly acute used-car problem for the dealer at this season.

The factories are simply taking the position of urging dealers to refrain from taking in used cars at a price which augurs against ready sale. The general feeling is that the open car will present the used-car problem of he next few years.

Cadillac's Striking Autumn Display at Chicago



CHICAGO, Sept. 30—Featuring the new Type 61 Victoria and the new five passenger coupe, the annual Cadillac Enclosed Car Salon was held in the show rooms of the Chicago branch of the Cadillac Motor Car Co. for two weeks, Sept. 17 to 30. The autumn salon displayed the complete line of enclosed cars.

An autumnal decorative scheme was installed throughout the salesrooms with bright hues of the fall colors forming a vivid background for the cars. The standard line was supplemented by a selection of custom jobs. It was originally intended to hold the show for one week, but the interest shown made it advisable to continue for the second week.

CANADIAN FORD REDUCED

DETROIT, Sept. 30.—Ford Motor Co. of Canada, Ltd., has made reductions ranging from $30 to $60. The chassis is now $395; runabout, $455; phaeton, $495; truck chassis, $545; coupe, $790; sedan, $870. Starting and electric lighting are standard on enclosed models and $85 extra on open models. The Ford company of Canada is independent of the American company, although Henry Ford controls both plants. Production of the Canadian plant is about 500 daily, as compared with 5,500 in United States. The Canadian car, because of structural differences and lower production rate, has always been higher than the United States car.

HARDWARE MEN'S SHOW

CHICAGO, Sept. 29—The Hardware Association will hold its annual convention at Atlantic City from Oct. 17 to 20. The motor accessories meeting will be held on Oct. 16 and 17. During the week a show will be staged at the Ambassador Hotel where the conventions will also be held.

150 Dealers and Salesmen Attend New Hampshire Outing

MANCHESTER, N. H., Sept. 30—There were 150 dealers and salesmen present at the annual outing of the New Hampshire Automobile Dealers' Association held a few days ago at Rye Beach. Following the dinner the business meeting began with the election of Perley P. Pillsbury of Manchester, president, and Fred H. Lowe of Tilton, secretary-treasurer. The general report showed the association in good condition numerically and financially.

CHICAGO BUS PLAN FAILS

CHICAGO, Oct. 2—The municipal government's experiment with the operation of passenger busses at a 5-cent fare, inaugurated during the street car strike last summer, has not been successful and it now appears that the plan of Mayor Thompson to spend $3,000,000 for the purchase of municipal busses will not be approved by the City Council.

During the strike a number of private owners of busses were authorized to operate them on certain streets at a 5-cent fare, with the approval of the city administration. Only a few of these continued after the settlement of the strike, and a few days ago the last of them ceased operation. At the same time the local transportation committee of the City Council shelved the mayor's proposal for a $3,000,000 investment in municipal busses so that it cannot go on the ballot for the November election.

Pacific Coast States Plan Uniform Traffic Control

Representatives of the Trade to Meet With Highway Officials and Others at Portland, Ore.

PORTLAND, Ore., Sept. 29—Monday and Tuesday, Oct. 9 and 10, in Portland, will occur what promises to be one of the most important traffic congresses ever held on the Pacific coast, when motor vehicle department heads, traffic officers, members of the judiciary and others interested in traffic problems from the states of Oregon, Washington, Idaho, Montana, Nevada, Utah, California and the province of British Columbia will meet to discuss closer co-operation in handling automobile traffic on the highways.

The meeting has been called by Secretary of State Kozer of Oregon, acting in conjunction with L. D. McArdle, director of the department of efficiency of Washington. The two men met in Portland this week and drew up plans for the conference, which is expected to draw 100 or more leading officials from the Pacific coast states to Portland.

Uniformity of Codes Sought

The session at this time is in the nature of a continuation of a movement two years ago in which Oregon and Washington got together in the matter of traffic regulations. At that time confusing differences in traffic laws which made it difficult for Oregon motorists to travel in Washington and vice versa were ironed out, and as a result the two states now have virtually identical codes. In announcing plans for the session both Kozer and McArdle declared the opinion that ultimately traffic regulations should be similar throughout the entire country, but that until that period could be reached it would be highly advisable to bring about a uniformity on the Pacific coast, if possible.

Invitations have been sent to the following in the states mentioned: Traffic officers, court officials, enforcing officers, the press, directors of automobile dealers' associations, and directors of automobile clubs.

An indication of the scope of the meeting is shown by the list of subjects which will be taken up. This follows:

1—Motor vehicle lights and the need for uniform requirements.

2—State versus county and city traffic control.

3—Co-operation between counties and states in the handling of traffic problems. (This referring particularly to British Columbia participation.)

4—Traffic conditions in Washington and need for co-operation.

5—Traffic conditions in Oregon and need for co-operation, state and local. The province of the traffic officer.

6—Registration of motor vehicles of non-residents and its value to the public in protection of persons and property.

7—The duty the public owes to the state in intelligent use of the highways.

8—The attitude of the courts with respect to traffic violations.

9—Auto thefts, their treatment and theft reports.

10—Laws and why we have them.

11—Hand and arm and mechanical signals, and operators', drivers' and chauffeurs' licenses.

12—Uniform reports on accidents and their necessity.

13—The province and accomplishments of the press in connection with traffic regulations.

F. C. Zillman, Jr. Puts His 5 Pounds Into the Game

PEORIA, Ill., Oct. 2—The following letter to the members of the Illinois Automotive Trade Association announces the arrival of a new assistant for Secretary F. C. Zillman.

"I am the new assistant secretary of this association, an appointee of my father. I was tendered the position immediately upon my arrival Sunday evening. Although I am without previous experience my father is confident that I can fill the bill.

"If a blue-eyed man of five pounds four ounces can have any influence, then you may feel assured that we are going to have a still bigger and better association.

"Yours for intensive cooperation, F. C. Zillman, Jr., Asst. Sec'y., by His Daddy."

Receivership of Republic Truck Co. Won't Affect Sales

DETROIT, Oct. 2—F. E. Smith, president of Republic Motor Truck Co., and Republic Truck Sales Co., said today that the sales company would be in no way affected by the receivership of the manufacturing company. Sales of the trucks will continue as formerly under the direction of the sales company's officers. Business is showing gradual improvement, Smith said, and with the reorganization of the manufacturing company's affairs, should progress rapidly.

The receivership action, Smith declared, was purely a defensive proceeding designed to protect the company against suits by creditors objecting to the reorganization plans which had been drawn and approved by about 70 per cent of the note holders. With the receivership in effect, the bankers' committee, headed by C. N. Gillette, vice-president of the First National Bank of Chicago, will work to get the acquiescence of the remaining 30 per cent.

The company is operating under a temporary financing program which had been arranged by the company with its banking committee.

"FACTS AND FIGURES" IN GERMAN

NEW YORK, Oct. 2—"Facts and Figures for 1921," the statistical publication of the National Automobile Chamber of Commerce, has been translated into German by Dr. R. Allmers of the Hanna-Lloyd Werke, Bremen, Germany.

40 Dealers Signed Up for the Detroit Air Cooled Car

Company Buys Assembly Plant and Expects to Begin Production in December

DETROIT, Sept. 30—Detroit Air Cooled Car Co. has purchased an assembly building in Wayne, near Detroit, in which it will begin production of its air cooled line in December. The building will be used exclusively for car assembly and will have a capacity for about fifty cars daily. Financial plans of the company are about complete, according to President W. J. Doughty, and have advanced to such a point that arrangements for manufacturing are now rapidly being closed.

All of the parts of the company will be made by specialized unit makers, in almost every case being specially designed for the air-cooled line. Throughout the engineering, effort has been directed to elimination of moving parts and the general accessibility of each unit has been the important consideration.

The car will sell in the phaeton model for $1,250, the coupe for $1,700, and sedan $1,750. Bodies for the line have been specially designed. Contracts with distributors and dealers have been made in 40 important cities, and Doughty declares these will cover production for the first year.

POOLING URGED FOR TRUCKS

ELMIRA, N. Y., Oct. 2—The motor truck operators here in Chemung County, were urged today to pool their interests for the sake of group insurance and other benefits by F. W. Fenn, Secretary, National Motor Truck Committee, National Automobile Chamber of Commerce, who spoke before a joint meeting of the Elmira Chamber of Commerce and Traffic Club.

TIRE OUTPUT DECREASES

NEW YORK, Sept. 29—The monthly report of the Rubber Association of America compiled for the Bureau of Foreign and Domestic Commerce shows that July, 1922, produced 2,476,636 casings, a decrease of 93,888 from July of last year. The production of tubes for these comparative months was about the same, this July showing an increase of 7218.

ST. PAUL TO HAVE SHOW

ST. PAUL, Minn., Sept. 28—An enclosed car show is planned by the Automobile Dealers' Association for Oct. 11-14 in the municipal auditorium, the first in two years. A committee is made up of W. H. Schmelzel, W. S. Williams, E. H. Nolan, L. W. Kordan and Einer Loo.

END OF DAYLIGHT SAVING IN CHICAGO

CHICAGO, Sept. 29—Daylight saving time, which has been in effect in Chicago by city ordinance since early summer, was discontinued Sept. 24.

13-Year-Old Boy Wins National Essay Contest on Making Highways More Safe

More Than 400,000 School Children From Every State and Territory Participated in Competition Managed by National Automobile C. of C.

WASHINGTON, Oct. 2—Highest honors open to elementary school pupils of the nation were won by Stanley Newcomb, eighth grade, Lincoln school, San Diego, California, who wrote the best paper in a national safety essay contest last autumn, according to announcement here today by the Highway Education Board.

Competing with him for this honor were more than 400,000 elementary school children from every state, territory and possession, said to be the largest number ever to participate in a national essay contest. As a reward he is entitled to a gold watch and a trip to Washington, D. C., with all expenses paid, where he will be the guest of officials of the Highway Education Board, the National Automobile Chamber of Commerce, which offered the prizes in the contest, and dignitaries and officials of the Nation.

Miss Merlene Beck, a pupil in the Draper, Utah, public schools, won second honors, a gold loving cup, and James Edward Gillenwater, a Knoxville, Tenn., pupil, was awarded third honors, a silver loving cup. In addition to these national prizes, 478 state prizes were given for essays, including 54 gold medals and checks for $15.

The subject of the essays was "How I Can Make the Highways More Safe." At the time the essay was written the national winner was 13 years old. He is the only son of a widowed mother, and says his ambition is to be an editor.

A similar contest is being announced again by the Highway Education Board as part of its "Safety Season" for 1922. The contests have been instrumental in reducing traffic accidents among children.

Stanley Newcomb's essay in part follows: "People throughout the land are awakening to the fact that we are facing a great national problem. 'What I Can Do to Make the Highways More Safe' is a subject which should receive serious consideration by everyone. Applied personally, I am such a small speck of humanity in this great world that at first it seems presumptious to imagine that I can be of assistance. On further consideration it occurred to me that if all the little specks, children from coast to coast, will earnestly discuss the problem with parents, teachers, and companions, and will take precautionary measures to prevent accidents, it will aid greatly in decreasing the number of automobile injuries and fatalities."

MAINTAINING TRUCK OUTPUT

SPRINGFIELD, O., Sept. 28—An average of 50 motor trucks a month are being turned out now at the plant of the Kelly-Springfield Motor Truck Co. The production for the last month was 54 trucks. Reports from distributors show that there is an increasing demand for trucks, representatives of the company say.

Fifty men were added to the sheet metal department during the past week at the plant of the International Harvester Co. Supt. C. H. Smart says the Springfield works is keeping up with its schedule of 25 speed trucks a day, and shipments are going forward.

4¼-MILE BRIDGE AIDS TRAFFIC

WILLIAMSON, N. C., Sept. 29—North Carolina's greatest highway bridge has been formally opened to traffic. It is across the Roanoke River at Williamston, is four and a quarter miles long and cost a trifle less than $500,000.

It is of concrete construction and it took 8 months to build. The bridge gives the counties of Northwestern North Carolina access to the balance of the State. Before the bridge was constructed adjoining counties, with only the river between, were actually separated a hundred miles and more in so far as any kind of vehicular traffic was concerned.

Houston Automobile Men in Big Association Meet

HOUSTON, Tex., Sept. 28—One of the most rousing meetings of the automotive men here was held this week by the Houston Auto Trades Assn. President C. W. Manford issued a special appeal for every man engaged in any line of the automobile business in Houston to attend, and the most of them were out. The big points in the program discussed were getting behind a $6,000,000 bond issue for roads about Houston, give moral and financial support to probe of thefts and prosecutions of persons doing the stealing of cars, tires or parts, inaugurating of a credit department with a card index showing the record of every customer in the county as to ability and inclination to pay debts, and naming a committee to fight unfavorable legislation, city, national or state.

DE PALMA INSPECTS PAN PLANT

MINNEAPOLIS, Minn., Sept. 30—Ralph De Palma, automobile racer, has been inspecting the plant of the Pan Motor Co. at St. Cloud, Minn. De Palma was accompanied by W. E. Merrill of the Lafayette Minnesota Motor Co., of Minneapolis.

Two New Chevrolet Plants To Produce 800 Cars a Day

Work to Begin at Once on New Buildings at Buffalo and Cincinnati

DETROIT, Sept. 30—William S. Knudsen, vice-president of Chevrolet Motor Co., in charge of operations, announces that work will be begun at once on two important industrial additions at Buffalo and at Cincinnati.

A tract of 29½ acres of land has been obtained at Buffalo, on which buildings will be erected at once, with 400,000 square feet of floor space for the Chevrolet Motor Car Co., and 200,000 square feet for the Fisher Body Corp. Both companies are subsidiaries of General Motors Corp. Chevrolet will employ about 2000 men at Buffalo and Fisher about 1800, with a daily pay-roll of approximately $23,000. The plants will produce 500 complete cars daily and every effort will be made to have them operating shortly after the first of the year.

At Cincinnati, a tract of land comprising 16 acres has been acquired at Norwood, a suburb about 5½ miles from the Cincinnati City Hall. The Norwood buildings will have 200,000 square feet of factory space for Chevrolet and 150,000 for Fisher. Chevrolet will employ 1200 men and Fisher about 900 in the production of 300 completed cars daily. The daily pay-roll will approximate $14,000.

HIGHWAY BODIES ELECT OFFICERS

MINNEAPOLIS, Minn., Sept. 29—The Associated Highways of America in convention in Minneapolis has elected as officers: President, H. O. Cooley of the Yellowstone Trail Association; vice-president, John Hausserman of New Richmond, O.; secretary-treasurer, E. Bee Guthrie of Tulsa, Okla.; members of board, L. L. Newton of the National Park to Park Highway, H. A. Russel of Fort Scott, Kan., A. D. Young of Canadian, Tex., A. W. Tracy of Duluth, and Cyrus Avery of Tulsa, ex-officio. Congress will be urged to adopt a trunk line system of roads.

TO DOUBLE GENERAL TIRE OUTPUT

AKRON, O., Sept. 29—Between now and the first of the year the General Tire & Rubber Co. proposes to double its capacity, which will give it a capacity of about 4500 tires a day. The expansion will cost about $200,000 and will be in the nature of machinery, rather than buildings.

275 CLEVELANDS SHIPPED A WEEK

CLEVELAND, Sept. 28—For the first seven months of the year the Cleveland Automobile Co. shipped about 6600 cars and for the past two months shipments have been at the rate of 275 a week. It is expected that the total production for the year will total 10,000 cars.

Texas Cotton Crop Buying Automobiles for Farmers

Retail Sales Show Decided Improvement as Marketing Season Progresses

DALLAS, Tex., Sept. 30—There has been a general improvement in the automotive business in Texas during the past 15 days. Reports from retailers in various parts of Texas show there has been an increase in the number of cars sold ranging from five to 15 per cent. Tire dealers report their sales have increased some five per cent and accessory men say business has been better than for any similar period this year. Truck dealers report increase in sales amount to from five to 10 per cent in various parts of the state. Tractor and trailers have been selling in increased numbers, dealers declare.

The general increase in the retail business all along the line is attributed to the movement of the cotton crop. Farmers are rapidly gathering cotton, selling it at a good price and more money is in circulation.

Automobile dealers have not overlooked the farmers this year. They have reasoned that a car or a truck is as essential to the modern farmer as to the business or professional man, and they have not been wrong in their decisions. They are selling more cars and trucks to farmers right now than ever before.

The distributors have found their business greatly increased. One distributor in Dallas last week ordered a solid train load—thirty-four cars—of automobiles. He said practically the entire lot had been spoken for.

The retailers expect business to be brisk for a couple of months and even in the winter they are not expecting the trade to slump as it has for the past three years.

THEFTS REDUCED IN CHICAGO

CHICAGO, Sept. 29—Reduction of about 37 per cent in automobile stealing as compared with the corresponding period last year in Chicago has been effected through the operation of a special motor division of the police department, according to statistics prepared by Capt. John Naughton, commanding the motor division of the police department. From Jan. 1 to Oct. 1, 1921, 4477 cars were reported stolen in Chicago and 2972 were recovered. So far this year 2809 cars have been reported stolen and 2808 have been recovered. The discovery of a number of organized theft rings and the arrest of the operators went a long way toward the reduction of theft.

LARGE SHOW AT MEMPHIS

MEMPHIS, Tenn., Sept. 28—The Tri-State Fair is on at Memphis this week, closing the night of Sept. 30.

The automobile show at the fair breaks all records of past years in point of beauty. Nearly every exhibitor enhances attractions with the display of 1923 models, lavishly designed and specially equipped.

Henry W. Osoinach, secretary of the Memphis Automobile Dealers' Assn., is manager of the show and at the close of the fair he will terminate his relation with that body to become general agent for a life insurance company.

Protest Against Early Announcement of New Models

CHICAGO, Sept. 30—Acting upon the complaints received from a number of individual members, the Board of Directors of the Chicago Automobile Trade Association has adopted a resolution protesting against the announcement by manufacturers of their new models and new prices as much as six months in advance of the season for which they are intended. It was stated that the association opposes the policy of mid-season announcement of new models and new prices because it has a tendency to slow up buying not only of the cars in question but of other cars as well.

CHICAGO DEALERS REPORT

CHICAGO, Ill., Sept. 30—Dealers here have felt but slightly the effects of the recent railroad strike. Shipments of automobiles have continued with the same regularity as always and, in some cases, heavier shipments have been received.

Sales in the enclosed car field have remained about the same during the past week excepting in the cases where special sales effort was put into this department. Some of the establishments, both along the "row" and in outlying districts, have held shows in their salesrooms and the results were reported as anywhere from fair to excellent.

Used cars of the open type have moved remarkably well where a winter top was installed and this section makes up the biggest part of a great many dealers' sales.

MILLER'S TIRE OUTPUT HEAVY

AKRON, O., Sept. 30—The Miller Rubber Co., one of the first tire producing companies in the Akron district to resume payment of preferred stock dividends which were suspended during the low ebb of the automobile slump, after having paid its quarterly preferred dividend of two per cent on Sept. 15, has declared a similar preferred dividend payable Dec. 1.

Miller production is heavier than ever before in the company's history, according to Jacob Pfeifer, president, tire output exceeding 6500 casings a day. Wm. Pfeifer, treasurer and general manager, sailed Sept. 22 for an extended survey of economic conditions in European countries.

New Models Keep Sales at High Point in New England

August Was Best Month of Year With September Business Only Slightly Less

BOSTON, Sept. 29—Automobile business in Boston continues to be very good. The retail sales are not quite as good for September as they were for August. August was better than July, and July was much greater than any of the previous months, and new records were made by nearly all the dealers for that season. There was no seasonal slump.

Interest continues to keep up with people coming back from vacations. The live dealers did not allow distance to stand in the way of sales. One salesman took a week end drive from Boston to York Beach, Me., to get hold of a Bostonian away for the Summer, and he got the order. Another went to Buzzard's Bay and put over an order.

C. P. Rockwell, Nash distributor, for example, ranks second in the entire Nash organization of 35 distributors, some of which have larger areas and population. He has done so well that he is considering using $1,000,000 this Winter to store cars for Spring delivery as evidence of his confidence that 1923 will be a big year.

The arrival of the new Peerless attracted a great deal of interest. Then Cadillac has started on its eleventh annual enclosed car salon, with the place artistically decorated giving a semblance of autumn foliage. Announcement of the new Buick line previously and the arrival of the new Marmon Phaeton, the newer Studebaker and other new models were some of the things that kept interest in motor sales in Boston alive. And the business at Boston has been reflected in other sections of New England.

OGREN HAS A NEW COMPANY

NEW YORK, Sept. 28—The Commander Motors Corp., with headquarters at 49 Wall street, is the successor to the H. W. O. Motors Corp. of Chicago. It proposes to build the Commander, a $5000 car designed by Hugo W. Ogren, at one time head of the Ogren Motors Co. of Milwaukee.

The company is capitalized at $2,000,000, all common stock, of which $1,500,000 has been placed on the market. C. F. Buman & Co., who are financing the proposition, claim to have placed $250,000 of this, with which manufacturing operations will start.

GRAY TO BE AT NATIONAL SHOWS

NEW YORK, Oct. 2—Gray Motor Corp., Detroit, has been elected to membership in the National Automobile Chamber of Commerce, and will exhibit the various models of Gray cars at the New York and Chicago shows.

CONCERNING MEN YOU KNOW

William A. Golden, a former post office inspector, has been added to the staff of the National Vigilance Committee of the Associated Advertising Clubs of the World and will devote his energies especially to fraudulent and deceptive advertising practices in the motor car, tire, battery and motor accessory fields. Golden was formerly associated with the Goodyear Tire & Rubber Co.

U. H. Strider has been named manager of the Hudson Motor Car Co. factory branch in Detroit, which succeeds Bemb-Robinson Co. as wholesaler of Hudson-Essex cars in the Detroit district. Strider was formerly wholesale manager for Bemb-Robinson, which continues to handle Hudson-Essex retail sales.

Fred I. Tone has severed his connection with C. H. Wills & Co., Marysville, Mich. He has been engineering executive during the development and production of the Wills Sainte Claire car. For several years previous, he was identified with the industry in Indianapolis.

R. H. Scott, vice-president and general manager of the Reo Motor Car Co., has been elected president of the Atlas Drop Forge Co., succeeding S. H. Carpenter, who died recently. O. C. Hartig has been named a director.

Harry W. Anderson has been appointed eastern zone representative for the Stutz Motor Car Co. of America, Inc. He was formerly connected with the Stutz company, but in the last six years he has been identified in an executive capacity with a number of automobile companies.

Fred V. McGraw has opened an office in Dallis, Tex., for the distribution of automotive products throughout the southwest.

Harry Gall Mason, formerly with the Allison Rood Co. of Chicago, has been appointed salesmanager of Lloyd Shanesey Co., Ford and Lincoln dealers in Chicago.

A. S. Johnson, formerly manager of the Stutz Chicago Co., has been appointed salesmanager of the John Nicol Co. of Chicago, distributor of the Saxon and Liberty cars.

Walter P. Chrysler, chairman of the board of directors of the Maxwell Motor Corp., back from a three months' trip through Europe, believes Great Britain is the export field which is most promising to the American manufacturer.

Fred J. Crowley has been appointed salesmanager for Peterson Motors, Inc., 919 North Broad street, Philadelphia, distributor of the Jordan car. Crowley for four and a half years was connected in an executive capacity with the Studebaker Corp. of America and was salesmanager of the Cleveland branch of Willys-Overland, Inc., for a year and a half.

Ross C. Lowrie has been made director of the new Oldsmobile show room in the General Motors building, Detroit, following a number of years of successful service in the Oldsmobile branch in Detroit. The company will continue to operate the branch under the management of William J. Clemens.

H. J. Swanson, for six years associated with the Detroit Machine Tool Co., has resigned as vice-president and general manager to accept the position of general sales manager of the Peerless Machine Co., Racine, Wis. He was for two years chief engineer of the Detroit company, and for the past four years occupied the executive office. He was instrumental in developing high speed drilling machines and centerless grinders for the Detroit concern.

August Engel, vice-president of the Milwaukee Brass Mfg. Co., 251-257 Lapham Street, Milwaukee, died Sept. 25 at the age of 69 years. He was one of the founders of the company in 1892 and widely known in the national brass industry.

URGES MIRRORS FOR SAFETY

WASHINGTON, Sept. 29—Accidents on the highways could be greatly decreased by the passage of uniform state laws requiring every truck to carry a mirror, giving a view of the road immediately to the rear, and by requiring every horse drawn vehicle, as well as automobiles, to display some sort of light when using the roads at night.

This is the opinion of M. O. Eldridge, director of roads of the American Automobile Association Good Roads Board, after making a careful digest of the traffic laws of all the states of the union. Eldridge, in a report to the Secretary of Commerce sets forth that 13 states have laws requiring the mirror on trucks, but that very few have any regulation for horse drawn vehicles. The states requiring mirrors on trucks are Vermont, Washington, California, Connecticut, New York, Indiana, Kentucky, Maryland, Massachusetts, Michigan, Missouri, New Jersey and the District of Columbia.

DES MOINES NEWS NOTES

DES MOINES, Ia., Sept. 28—The Buck-Cook Motor Co., Chevrolet dealer in Highland Park, Des Moines, has moved into new quarters at 3805 6th Avenue.

The Porter & Lott Battery Co. has moved to 3710 6th Avenue and added a tire and vulcanizing department.

W. E. Lohr, formerly with the Cunningham Auto Clearing House, has joined the Payne Motor Co., Paige distributor for Iowa, and will be in charge of the used car department.

The Des Moines University Trade School is offering three distinct automotive courses: Automotive Electricity, Engine and Chassis Repairing and Vulcanizing. Each course requires six months' study and combines the underlying principles with plenty of practice.

Adrian Logan, formerly instructor in Automotive Electricity at Des Moines University Trade School, has opened up a repair shop at Second and Euclid avenue, Des Moines.

The Herring Motor Co. has taken over the business of Beamer & Wissler, dealers and jobbers in automobile accessories, at 1731 Grand avenue, Des Moines.

STROMBERG NET PROFITS

CHICAGO, Sept. 30—Net profits of $192,328 for the quarter, after charges and Federal taxes, or the equivalent of $2.56 a share on 75,000 shares of capital stock outstanding, are reported by the Stromberg Carbureter Co. of America. In the first quarter of the year earnings equal to 40 cents a share were reported. Profit and loss surplus June 30 showed $2,657,549, against $2,465,221 for the quarter ending March 31. The consolidated balance sheet as of June 30, 1922, shows total assets of $3,624,818.

DRY SPELL AIDS TRACTORS

OMAHA, Neb., Sept. 28—The continued hot and dry weather in this section has made plowing unusually hard and as a result farmers have been forced to put horses in the pastures, call the nearest tractor agency, and wait for help.

URGE GASOLINE TEST LAW

CLEVELAND, Sept. 29—Automotive construction engineers in this city have come forth in support of the state-wide demand in Ohio that an oil inspection law be enacted to protect users of automobiles from low grade gasoline.

Pacific Coast Ford Dealers Organize to Improve Service

LOS ANGELES, Sept. 30—Ford dealers of the Pacific coast territory under the jurisdiction of B. L. Graves, regional director for the Ford Motor Co., over the branches at San Francisco, Los Angeles, Portland, Seattle, Salt Lake and Denver, are being organized and announcement has been made that the policy will extend throughout the entire country.

The purpose of the organization is said to be to familiarize the dealer with the improved sales plans, service policies and other matters of general interest as they affect each representative in his own locality.

Service is the point receiving most consideration. Attention is also being given to plans for furthering the sale of the Fordson industrial tractor. The meeting held here was attended by 100 Ford dealers.

MASON TIRE CO. TO EXPAND

AKRON, Sept. 30—Stockholders of the Mason Tire & Rubber Company of Kent, near Akron, will have submitted to them for their ratification, at a special meeting on Oct. 17, a complete refinancing program which will include issuance of $2,000,000 in first mortgage bonds.

The Mason company recently purchased the plant of the Owen Tire & Rubber Co. at Bedford, near Kent, and now is in production there at the rate of 500 tires daily. Funds derived from the refinancing measures, which stockholders are expected to ratify, will be used to complete the financing of the Owen plant and to increase production there to 1500 tires a day so as to give the Mason company a daily output of 6000 casings. The capital stock of the company will be increased from 150,000 to 350,000 shares of no par value stock. Part of the funds from the refinancing program will also be used to refund $540,000 worth of outstanding seven per cent serial notes.

PROGRESS OF DUNLOP IN U. S.

LONDON, Sept. 14—(By mail)—Plans for financing the American business of the Dunlop Rubber Co. are progressing most favorably and it is expected that within a few weeks enough money will be assured to enable the Dunlop Tire & Rubber Corp. of America to go ahead. A representative of the American banking interests is on his way to London to conclude the negotiations.

957 MILES IN 34 HOURS

LOS ANGELES, Sept. 30—A new round trip record between Los Angeles and Phoenix was recently established by a Reo car driven by Charles Bigelow. The total distance of 957 miles was made in 34 hours 48 minutes elapsed time, lowering the record by two hours 58 minutes. The Reo was a strictly stock touring model, with the exception of shock absorbers.

IN THE RETAIL FIELD

James D. Flowers recently purchased the interest of Williams in the Futch-Williams Motor Co. of Montgomery, Ala. The name of the concern has been changed to the Futch-Flowers Motor Co. This concern handles Fords, Lincolns, Ford trucks and Fordson tractors. They are located at 7 Cloverdale road.

Everett Pfund, Lincoln, Ill., has opened a sales agency on South Logan street, that city, and has been appointed distributor for the Rickenbacker car in the Logan county territory.

West Side Motor Sales Co. has been organized at Argo, Ill., and has opened a garage and sales agency at the corner of 63rd street and Archer avenue.

McWilliams-Moore Motor Co., Huntsville, Ala., will handle the Durant and Star cars in Madison, Limestone, Jackson and Morgan counties, Alabama.

Wilke Auto Electric Co., New London, Wis., has been dissolved. William and Irving Wilke have retired and the business will be continued by Henry Moritz.

Paynter-Buth Motor Car Co., Appleton, Wis., has been organized by Howard Paynter and William J. Buth to act as Wills-St. Claire and Velie dealers, with headquarters at 735 Washington street.

Henderson Garage at Sarona, near Rice Lake, Wis., managed by John Bauers, was almost totally destroyed by fire. It will be rebuilt and re-equipped.

Berg Bros., Lodi, Wis., for several years conducting a general automotive service shop, have been appointed Studebaker and Chevrolet dealers.

Jacobsen Auto Co., Racine, Wis., has started construction work on a $20,000 addition to its sales and service building, 1-story, 85x102 ft.

Albert Schuetze, Manitowoc, Wis., has been appointed Hudson and Essex dealer.

Minten Motor Car Co., Menomonee Falls, Wis., has been taken over by Louis K. Benson and Fred B. Lalk, both formerly connected with the Kissel Motor Car Co.'s main works at Hartford, Wis. They will continue the business as the Falls Garage.

Bearings & Gears Sales Co., Milwaukee, is a new $15,000 corporation organized to take over the local business of the Bearings Service Co., at 145 Oneida street.

Edgar Bass and Howard Woolard, Oconee, Ill., have purchased the Ford garage in that city of Otis Slater and possession was given Sept. 20.

Norman Fraser, Streator, Ill., finds that increasing business demands the erection of a larger building for his motor car sales agency and maintenance station. He has purchased the buildings at 112-114 South Park street and will replace them with a two story structure of brick. The new quarters will be ready for occupancy about Jan. 1.

Wallis Baird, Galesburg, Ill., has been appointed distributor for the Star car in the Knox and Warren counties territory.

Hilmer Motor Sales Co., 721 North Grand avenue, Springfield, Ill., has been appointed distributor for the Cleveland car in the Sangamon county territory.

Universal Motor Car Co., Memphis, Tenn., Jas. M. Walker, president, has nearing completion on Jefferson avenue near Third, its new building to cost about $50,000.

The Hull-Dobbs Co., Ford and Lincoln dealer at Memphis, has occupied its new home at the corner of S. Third street and Gayoso avenue, about two blocks from S. Main street.

Tivoli Motors Co. of Chicago, distributor of the Noma car, has also been appointed distributor for the Templar car.

L. O. Naylor, who recently severed his connection with his brother, T. W. Naylor, in the T. W. and L. O. Naylor Co., Salt Lake City, Utah, has been appointed distributor for the Nash. His territory will include Utah, most of Idaho, southern Oregon, western Wyoming and eastern Nevada.

The John K. Leander Co. has been incorporated for $100,000 and has begun business in Portland, Ore., as retail dealers for the Studebaker car. For the past year, since the retirement of the W. C. Garbe company, the Studebaker retail has been handled by the Portland factory branch of the Studebaker corporation.

Lewis M. Smith and J. W. Rile have organized the Everybody's Accessory Co., at 118 East Long street, Columbus, O., where a full line of accessories will be handled.

The Columbus-Liberty Motor Co., has been organized with E. T. Ash as manager to distribute the Liberty Six in Columbus and central Ohio.

E. M. Walcutt has been named central Ohio distributor for the Anderson. He is located at 152 North Fourth street, Columbus, Ohio.

The Russell Motor Car Co., at 200 East Gay street, Columbus, O., has been chartered under Ohio laws to distribute the Dort throughout central Ohio. E. N. Russell is president and G. E. Spicer, secretary and treasurer.

B. W. Ellis and Frank Babbitt, two well known automobile men, have organized the Jordan-Columbus Co., to handle the Jordan at 264 North Fourth street, Columbus, O.

The Hallwood Motors is the name of a new concern at 66-68 Parsons avenue, Columbus, O., to handle the Westcott. Nathan Hallwood is at the head of the concern.

The Medick-Erb-Ferguson Co., at 2584 North High street, Columbus, O., is a new authorized Ford agency in Columbus dealing in cars and Fordson tractors.

Meagher & Bouchie have organized Hampden Motors, Inc., to distribute the Gray in Springfield, Mass., and will open a salesroom immediately. The car had its first showing there at the Eastern States Exposition, Sept. 17-23.

H. P. Baldwin is to distribute the Haynes in Springfield, Mass., and will open a store in a building now being completed in Main Street.

W. C. Cizek has opened a Chevrolet service station in West Springfield, Mass., and will also do general automobile repair work.

Springfield Oldsmobile Co. has opened new quarters in Springfield, Mass., for the distribution of the Oldsmobile.

Overland Springfield Co. has opened its new building for the distribution of the Overland and Willys-Knight at Springfield, Mass. Rudolph Meyer heads the concern, with Victor Catok as retail sales manager and William E. Seavers, formerly of the Willys-Overland branch here, as service manager.

Badger State Tire Co., Madison, Wis., distributor of Hawkeye tires, made at Des Moines, Ia., has opened a branch warehouse and store at Janesville, Wis.

Riesmeyer-Rank Motor Car Co., Cedarburg, Wis., has been incorporated with $25,000 capital stock by William Riesmeyer, George Rank and Fred Rank, to deal in motor vehicles and equipment.

Krisor Bros. Garage, 762 Milwaukee Avenue, Kenosha, Wis., has been appointed local dealer in the Durant and Star. A new garage and service shop has just been completed.

Hazey & Robbins, LaCrosse, Wis., have been appointed Oldsmobile dealers and are opening a new sales and service station.

Van Lente-St. Clair Co., Manitowoc, Wis., has been awarded a Chevrolet franchise and is opening a sales and service station in the former Buick Garage at Eleventh and Franklin Streets.

Daggett-Yewdale Motor Co., 626-630 Wells Street, has been appointed distributor of the Gray in Milwaukee and vicinity.

Steven Knedle, Two Rivers, Wis., has purchased the garage and repair business of Joseph Salkowski at Kewaunee, Wis., and took possession Oct. 1. The new owner has been appointed Durant and Star dealer.

WARNS AGAINST SPEED TRAPS

MILWAUKEE, Wis., Sept. 29—Taking cognizance of the damage to Wisconsin tourist business caused by the pernicious activities of "small town" speed "cops," who make themselves obnoxious by their eternal vigilance and in many cases officiousness, the Wisconsin highway commission has issued a circular to all municipal police departments and sheriffs of the state, pointing out the menace. "The sneaking habit of hiding behind bushes and springing out on the unwary traveler is to be condemned," says the commission. "Officers enforcing speed laws should be in uniform. It is to be hoped that several neighborhoods where the business is already reported to have been affected by the obnoxious enforcement of the speed laws, will take steps to warn speeders before a penalty is assessed. Above all, sneaky, arbitrary, unreasonable, half-baked, or under-aged speed enforcement officials should be checked for the good of the state."

Large Building Program for Motor Row at Indianapolis

INDIANAPOLIS, Sept. 30—Meridian street auto row of this town is experiencing a brisk automotive building boom in the block just below Twelfth Street. Approximately $1,000,000 in real estate sales and leases for five new automotive buildings will change hands and all of the buildings are expected to be up by late winter. The Indiana Battery Service Co. is the latest concern to announce a new building program, acquiring land by lease for a total rental of $317,800. In the building to be erected on the Meridian street front will be housed the Milburn salesrooms for which the company is distributor, and the Exide Service Station also run by the concern.

The Olin-Wilmeth Sales Co., Ford and Lincoln dealer, is progressing with its four-story building in the 700 block of Meridian street, and will have a spacious plant adequate for the large sales and service rooms necessitated by the activity of the concern.

Conduit Automobile Co. is also actively at work on a four-story plant for its Peerless, Chalmers and Maxwell business at Walnut and Meridian streets. This construction plan is one of the recent announcements and with the two other motor car sales plants, which will build new homes this winter, will run this section of the new automotive building construction cost to more than $1,500,000 in land and structures.

Besides this there is the Hassler-Indiana Co., with its new three-story sales and service building under way, and the Automotive Equipment Co., with another building not far from ready. Add to this, the recently remodeled two-story building of the Western Oil Refining Co., at Meridian and New York street, and the row is stepping out these early fall days with very substantial evidence that 1922 has been a very good year and that 1923 is expected to be even better for these concerns.

COMPLETING OHIO HIGHWAYS

COLUMBUS, O., Sept. 28—Ohio's primary highway system will be completed by next year and the bulk of funds available in 1923 will be expended in the development of the secondary system, Highway Director Herrick announced in outlining the building program for the coming year. Director Herrick asserted the main system is so nearly complete, that only small expenditures for reconstruction and widening of certain sections will be necessary next year.

MARYLAND CLUB GOES WITH N. M. A.

BALTIMORE, Md., Sept. 29—The Automobile Club of Maryland has voted to sever its connection with the American Automobile Association and cast its affiliation with the newly formed National Motorists' Association.

BUSINESS NOTES

Automotive Electric Co. has been chartered with a capital of $25,000 to manufacture, repair and deal in electric fixtures for automobiles. The incorporators are T. D. Lamb, F. M. Conley, E. M. Court, P. M. Kuedrle and S. D. Dodge.

The Haas Auto & Supply Co., 3943 North Broad street, Philadelphia, Stephen Haas, proprietor, has been appointed distributor of Amesbuilt bodies for Ford cars in the Philadelphia territory, which includes wholesaling in Pennsylvania, southern New Jersey and Delaware.

The Every Day Piston Ring Co., of East Rochester, N. Y., has opened a Minneapolis branch at 1110 Hennepin avenue. Teddy Rowe, formerly district manager for McQuay-Norris Piston Co. in St. Paul, is manager. He represented the St. Louis firm in Minnesota and the Dakotas.

Layhourn Auto Co., which has been formed to renew representation of the King Eight in Minneapolis territory, has opened at 1332 Nicollet avenue.

The buildings and entire equipment of the Fay Motor Bus Co., Rockford, Ill., were detroyed by fire Sept. 25. The loss was estimated at $150,000.

Wm. R. Johnston Mfg. Co., Chicago, has erected a new factory at 1300-1340 Fletcher street, for the manufacture of automobile windshield wings, windows and mirrors.

Announcement is made of the purchase of a factory site by the Davis Boring Tool Co., of St. Louis, fronting on Forest Park boulevard on the corner of Spring avenue. Preliminary work is now under way for the erection of a modern three story daylight factory.

The Ert Palmer Co., manufacturers' representative, has been organized at Milwaukee. Michael Ert is president and Paul E. J. Palmer, vice-president and director of sales.

New officers and four new directors were elected at the annual meeting of the stockholders of the Leach-Biltwell Motor Car Co. of Los Angeles. M. A. Leach was re-elected president and general manager, S. J. Ulrey of Ontario is first vice-president, Truman Berry of Whittier second vice-president, Alfred Ashby, secretary-treasurer. New directors are L. B. Ulrey of Oakland, C. S. Chapman of Fullerton, C. N. Hollingshead of Anaheim and Wm. Dibble of Pueente.

Cox Brass Manufacturing Co., Albany, N. Y., reports a 60 per cent increase in business during the year ended Aug. 1 in the sale of bumpers, mostly through dealers and distributors of passenger cars. Ground has recently been broken for an addition to the Albany plant, to be finished Jan. 1, which will double the capacity of that factory.

The Yellow Cab Mfg. Co., Chicago, recently distributed $246,922 among its employes as their share of the net earnings for the first six months of the year.

Southern Tire Co. will erect a modern fireproof home at Main and Larmar, Houston, Tex. The new home will be ready for occupancy in a short time.

H. H. Collins and Earl B. Smith have taken over the Chevrolet sales and service franchises in Houston and South Texas. The business for this line will be handled by two companies, the Collins Chevrolet Company and the Smith Chevrolet Company, both located here. Both men have a wide experience in the automobile business. While the companies maintain separate headquarters and sales rooms and staffs, they have a consolidated service station which is paying strict attention to their line of cars in the Houston territory.

Ajax Auto Products Co. of Racine, Wis., manufacturing lifting jacks and other items of car equipment, is erecting an addition to its plant at Fifteenth and Clarke Streets, estimated to cost $25,000.

The Gill Storage Battery Co. of San Bernardino, Cal., announces the formation of the Gill Battery Co. at Oakland, Cal. The new company is capitalized at $1,000,000 and will erect a new factory at Oakland to produce the Gill battery and distribute it in the Pacific coast states.

The Chevrolet Service Station at Minneapolis has been taken over by A. C. Schaefer, who will conduct it as the Sixteenth Street Garage. Louis L. Gross, former service station manager for the Chevrolet Motor Co., will continue in charge of the service department.

The Tunica (Miss.) Motor Car Co. will rebuild its brick garage, which burned in August. Wendell Owens is manager.

A bowling league has been organized by the Louisville Automobile Dealers' Assn. There are eight teams in the league, made up from as many firms in the association. Trophies will be awarded at the end of the season to the winning team, and several handsome prizes will be given for various individual records. The league members will bowl every Thursday night from 7 to 9 o'clock.

The Muskegon Motor Specialties Co., Muskegon, Mich., who have been for some time exclusive manufacturers of camshafts under the trade name, "Accuratine," is about to enter the piston field. This company will specialize on lightweight cast iron pistons.

The Motor and Accessory Manufacturers' Assn. announces the removal of its office to the Fisk building, 250 West 57th street, at Broadway, New York City.

The Appleton (Wis.) Motor Truck Co. has been incorporated with an initial capital of $25,000 by A. G. Brusewitz, M. Rossmeissl and W. G. Jamison for the purpose of manufacturing and dealing in motor vehicles, parts and equipment.

The incorporation of a new $500,000 concern known as the Wheary-Burge Trunk Co. at Racine, Wis., marks the establishment of a large new trunk manufacturing industry which will make special trunks and baggage merchandise for the motor car trade in addition to its main line of wardrobe trunks.

The Wisconsin Re-Grinding Co. of Sheboygan Falls, Wis., operating a large automotive machine and service shop, with a branch at Fond du Lac, Wis., is opening a second branch at Rhinelander, Wis., with Roy Nichols, vice-president, as manager.

The B Staff Selling Organization, central office, Canton, O., eastern office, Lake Waramaug, New Preston, Conn., has been appointed factory distributor for the Lomar shock absorbers for Canton and Youngstown, Ohio, Pittsburgh and the states of Connecticut, Rhode Island and Massachusetts. They are appointing a number of sub-distributors in these districts.

Ivan J. Amo, treasurer of the Heavy Hauling Co., Inc., has applied for a license to operate three buses between Springfield and Hartford Mass. on the west side of the Connecticut. He has already placed his order for the buses, which are to be of 25-passenger capacity each.

The Stevens Duryea Co. has opened a branch in Boston at 5 Brighton avenue in charge of Mr. Law, formerly of the Pierce-Arrow agency.

Donald C. Barbee, president and chief owner of the Badger Belt & Rubber Co., distributor of tires, belting and rubber goods of all kinds, and head of the Barbee Steel & Iron Co., jobber of metals and products, has acquired the five-story building at East Water and Huron Streets, Milwaukee, for $75,000. It will be remodeled and become the permanent home of the two corporations. The real estate is 35 x 135 ft., entirely covered by the building.

W. E. Grimes has opened a wholesale and retail accessory business at 1800 Commerce street, Dallas, Tex.

WIDENING CHICAGO'S MOTOR ROW

CHICAGO, Sept. 29—Work has been commenced to add 14 feet to the width of Michigan avenue from Twelfth street to Thirty-third street, through practically the whole extent of Chicago's notable automobile row. The widening is to be accomplished by taking 7 feet from the space between the curb and the building line on each side of the street. This will greatly relieve the congestion along the city's most popular automobile highway, and in the opinion of leading automobile dealers, will make it far more pleasurable to own and drive an automobile in Chicago.

"The widening of Michigan boulevard is a pronounced step in the direction of progress for Chicago's motor way system," declared Henry Paulman, a veteran dealer.

M. O. Eldridge Is Named Executive Secretary of A.A.A.

Development of Good Roads Is Outstanding Feature of Program

WASHINGTON, Sept. 30—M. O. Eldridge, for three years connected with the American Automobile Association, has been named Executive Secretary of that organization and will have complete charge of the association's work in the United States.

Outstanding in the program which he will endeavor to accomplish will be the development of good roads, with which he has been identified, most recently as director of the roads of the association, and prior to which he was for 25 years with the United States Bureau of Public Roads.

The reorganization of the Maryland A.A.A. will be undertaken at once, following the announcement last week that the members of the organization in Maryland had voted, almost unanimously, to sever their connection with the A.A.A. and become affiliated with the National Motorist Association.

INDIANA TRUCK INTERESTS ORGANIZE

INDIANAPOLIS, Sept. 30 — Allied Motor Commerce of Indiana, which was organized last fall as a federation of organized trade associations of the state whose members used motor transport, has been reorganized, and the scope of its work broadened. While the federated idea is still a part of the organization plan, the new constitution and by-laws make room for the thousands of individuals and firms of the state who employ trucks but who are not members of other organized trade bodies. There is also provision for the membership of those who though not commercially interested in motor transport or highway development are in sympathy with further expansion of the highway building and of greater use of motor transport.

THIEVES TAKEN IN SALT LAKE

SALT LAKE CITY, Utah, Sept. 30—The police, by the arrest of two men, one a mechanic and the other a junk dealer, have uncovered what they believe to be an elaborate plan to steal automobiles and automobile parts and reassemble and sell them. The alleged thieves are said to have operated from three places in the city. Their finished products are believed to have been shipped to Butte, Mont. The complaints of lost cars and parts increased rapidly of late and the police have already recovered a whole wagon load of stolen parts. More arrests are expected.

HYDRO TIRE RESUMES

PHILADELPHIA, Sept. 30—The Hydro United Tire Co., which recently went into receivership, has resumed operations with a minimum production of 600 tires a day. About 300 men are employed.

The READERS' CLEARING HOUSE

Questions & Answers on Dealers' Problems

This Man Makes His Own Index for Clearing House Articles

In reply to your letter of the 18th inst. will say that we did not have an opportunity to finish the job of locating trouble on the motor-generator of the model O-1919 Hudson, which would charge up to 10 amperes and then suddenly stop charging. This was due to the fact that the owner took the car back to the man from whom he purchased it and had it repaired there, but we are satisfied that the trouble was in a shorted armature.

We wish to say, however, that we appreciate the interest shown by MOTOR AGE in such problems and even though we did not have an opportunity to try out the suggestions given, feel they may come in handy at some future date. We have come in contact with a great many problems and have learned how to correct most of them very easily through the colums of MOTOR AGE.

To take advantage of the information, we have bound up the copies of MOTOR AGE in volumes, each of which contains issues for three months, and we make an index having all cars indexed in alphabetical order. For example, we will take the case of the trouble on the Hudson car and will put it down under Hudson, model O, 1919. Generator will not charge. Then in a small space we put in this case MOTOR AGE, Aug. 10, 1922, page 43. Then if we should meet with similar trouble later on we can look through the index and find out where this particular condition has been explained and can learn a great deal from the troubles and remedies which other shops have experienced.

We have another question to ask which has to do with the discussion we have had with two or three battery shop men who tell us that it makes no difference whether a battery in a car is wet and dirty on top and whether the box gets all water soaked or not. On batteries of this kind if you disconnect the cable and take a voltmeter reading from the terminals to the frame of the car it will often be found that there appears to be a leakage, and we would accordingly say that this battery is grounded. It is our opinion that a battery in this condition will not stand up very long and will not give good service. Furthermore, it does not show very much mechanical ability in a battery man to leave batteries in this condition and maintain that no harm can result. Kindly advise whether we are correct or not.—Edw. C. Fritz, Oklahoma City, Okla.

MOTOR AGE wishes to express appreciation for the above letter and also to recommend the procedure to other MOTOR AGE subscribers. The matter of making up an index is a question of probably 20 minutes to half an hour each week, but the value will repay many times for the time and effort expended. In regard to leaving storage batteries wet and dirty, would say that there is no question but what this is a practice which is to be condemned.

In the first place, it shows that the repair man is a sloppy workman and, if for no other reason than giving your customers a good impression, the battery should not only be cleaned and wiped dry but should preferably be given a coat of acid proof paint whenever it is charged, or the electrical system worked on, and such conditions are noticed.

From an electrical standpoint, it may be that the loss of current is so small that the effect is hard to determine and such an argument may be based on the fact that a battery without any external leakage will completely discharge itself in approximately three months, it being considered that one per cent a day is lost if no current is taken from the terminals, this being due to internal action. It therefore happens that if the actual amperage due to a wet or dirty box should be only a few thousandths of an ampere that practically it would do no harm. As above stated, however, it is bad practice and will without question cause some electrical leakage, aside from the fact that it gives a very bad impression to customers.

The Readers' Clearing House

THIS department is conducted to assist dealers and maintenance station executives in the solution of their problems.

Readers' names will not be published with articles, if a request to this effect is received with the letter. The name and address should be given, however, so that we can send a copy of our answer direct by letter. This saves waiting for the answer to be published, which sometimes occurs several weeks later, depending upon the space available.

Also state whether a permanent file of MOTOR AGE is kept, for many times inquiries of an identical nature have been made and these are answered by reference to previous issues.

Inquiries not of general interest will be answered by personal letter only. Emergency questions will be replied to by letter or telegam.

Addresses of business firms will not be published in this department but will be supplied by letter.

Technical questions answered by B. M. Ikert, P. L. Dumas and A. H. Packer; Legal, by Wellington Gustin; Paint, by G. King Franklin; Architectural, by Tom Wilder; Tires, by a Practical Tire Man; General Business questions, by MOTOR AGE organization in conference.

Cause of Bendix Bolt Breakage

Q—We have been experiencing a great deal of trouble with the Bendix bolt (the short one) breaking, this trouble being encountered on an Oldsmobile Model 47, eight cylinder, 1921 car.

We have replaced this short bolt twelve times in 7,000 miles' service. We have endeavored to determine just the exact cause of this breakage, but have been unable to do so. The motor will not kick back, and we have tried to make it do so under all conditions of service. The spring has never been sprung or broken. The bolt fits snug and tight and has no play. We have been using genuine Bendix bolts.—Wolverton Bros. Storage Battery Co., Lawton, Oklahoma.

Although you state that the engine does not kick it is possible that at times it is operated by some one that forgets and operates the starter without retarding the spark lever. Would also suggest your checking the spark timing to see that in the retard position the spark occurs slightly past top dead center. This is best accomplished by moving the spark lever on the steering wheel down one-half inch from the extreme retard position, and then set the spark to occur exactly on top center. When the spark lever is now fully retarded, the spark will occur slightly after top center.

Another possibility is that you have been using bolts of the older type, as a new stronger type is now being used, which is stamped with a letter "C" and can be obtained from any Delco or Oldsmobile service station. There is also a chance that the Bendix drive is one of the older types that did not have a steel sleeve under the spring to keep it from winding up tightly when the starting load is put on it, and if this is the case, it may be that a certain cramping action of the spring takes place which puts an added strain on the bolt. If this is the case a new type drive should be installed.

WHERE TO BUY OIL BAFFLE PLATES FOR OLDSMOBILE

Q—Inform me where I can buy a set of oil pans that go in between the crankshaft and cylinder block to keep the engine from pumping oil. There are a few Oakland and Oldsmobiles here that have these pans installed. Do you think it is all right to put new rings and these oil pans into keep it from pumping oil and smoking?—Henry Henning, Oakford, Ill.

1—We presume that you refer to the baffle plate which is now regular equipment on the Oldsmobile 6 and 8 cylinder engines. As these baffle plates are factory equipment they can be secured from any authorized Oldsmobile or Oakland agency.

Architectural Service

IN giving architectural advice, MOTOR AGE aims to assist its readers in their problems of planning, building and equipping, maintenance stations, garages, dealers' establishments, shops, filling stations, and, in fact, any building necessary to automotive activity.

When making request for assistance, please see that we have all the data necessary to an intelligent handling of the job. Among other things, we need such information as follows:

Rough pencil sketch showing size and shape of plot and its relation to streets and alleys.

What departments are to be operated and how large it is expected they will be.

Number of cars on the sales floor.

Number of cars it is expected to garage.

Number of men employed in repair shop.

And how much of an accessory department is anticipated.

Two Story Storage Garage With Ramp

Q—I am a reader of your magazine but have always passed it on to others after reading it, so have only the latest numbers on hand. I am contemplating building a storage garage and am very anxious to receive any suggestions you may offer. If you have one or two views you could send me that would help me to decide, I would be very grateful to you. I have seen many of them in past issues of MOTOR AGE but have none of these issues available at this time. This building is to be two stories high, no cellar, fireproof and run-way if not too steep.—R. G. Perry, Waverly, N. Y.

It is unfortunate that your lot has the 10 ft. strip taken out of it since it is almost too narrow for a garage with ramp as it is. There are certain widths which are most suitable for garage purposes and 50 ft. sections work out best for all concerned. This width seems to strike a medium between convenience and efficiency. Spaces as narrow as 45 ft. begin to border on the impossible except where exclusive Ford storage is handled, then 40 ft. is the limit.

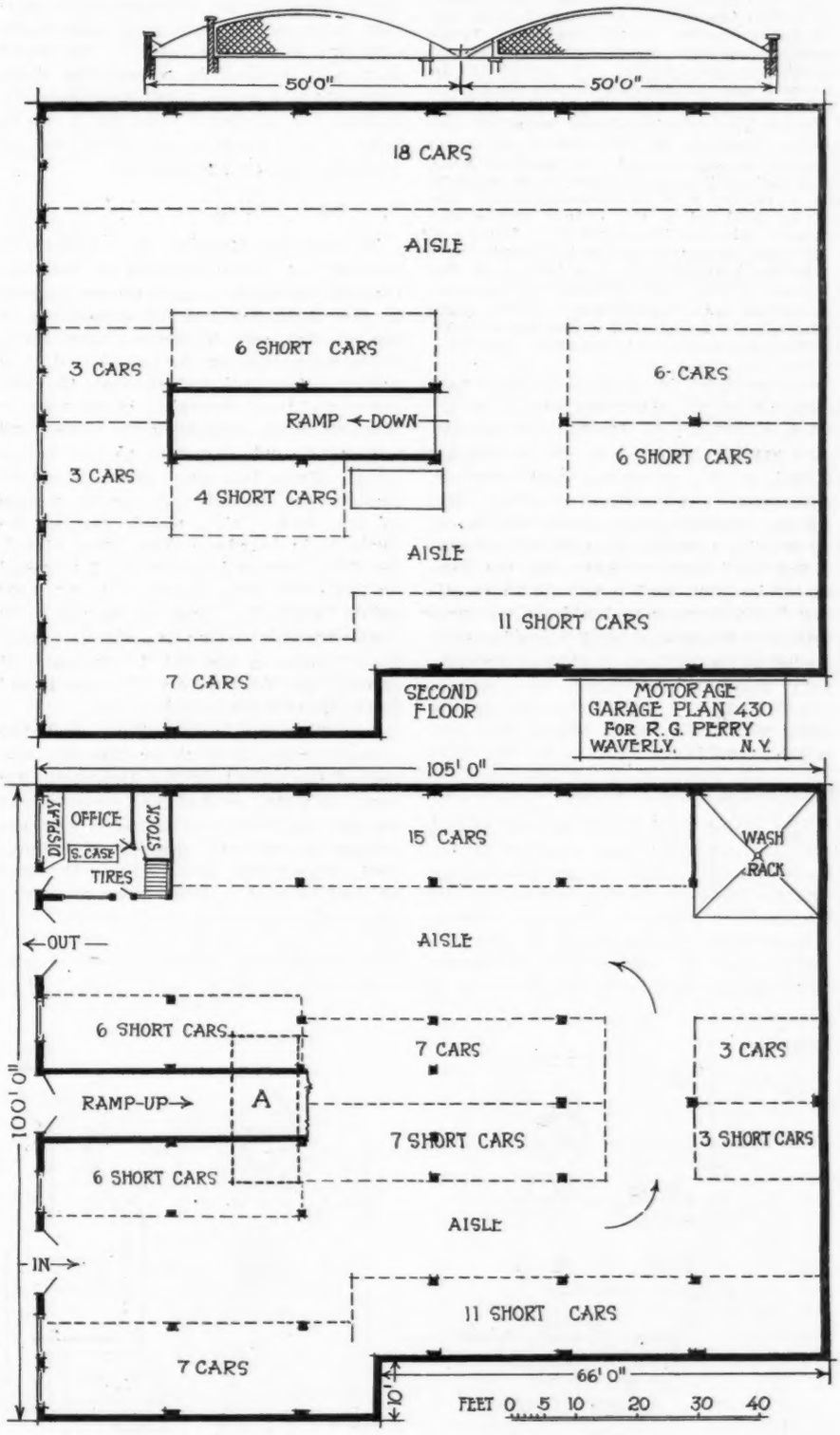
Your 100 ft. front naturally divides into two 50 ft. sections and to take 10 ft. off of either of these sections would make it too narrow for practical purposes. If you place the ramp in the center as indicated in our plan, you cut down the width of each section to 45 ft. which isn't so good, but still possible. The greater part of one section on the lower floor would be full width but the side cut into by the jog would have to be reserved for short cars only.

As laid out our plan would accommodate 60 Fords and 69 longer cars. It is advisable to keep the ramp as far forward as possible, in order to keep it from conflicting with the narrow rear part of the building. If, however, it is desired to have the entrance to the ramp inside the building, it would have to be moved back bodily 20 ft. and would cut down storage capacity considerably. The stairway, wherever you place it, will be at the expense of a car storage space on each floor, probably just back of the office would be a good place.

We are not enthusiastic over the use of a ramp in this building and believe an elevator would be more satisfactory from many angles. Placed at A, it would be convenient and have a good approach from either side but whatever system is used the aisles and general layout would be the same. The trusses could all be built to one pattern but with the ends adapted to the shorter spans where necessary; this treatment would make the roof surface uniform.

Lattice trusses would work very well on this job, since they have more load carrying points and can be adapted to the different lengths without redesigning.

If the elevator should be adopted instead of the ramp, the office and accessory store should occupy the central position between the entrances so that cars could be observed going and coming as well.



Maxwell Starter Runs as a Motor, But Does Not Generate

This Answer Contains Simple Tests for the Maxwell System, One Which Often Bothers the Best Electricians

Q—We have a Maxwell car, 1916 model on which the generator will not send any charging current to the battery. However, when the cutout points are closed it will run as a motor. We would like to know if the voltage winding in the cutout being broken, could cause this trouble. Would also like to know whether the shunt winding in the generator, being opened, would prevent the machine from generating, but still allow it to operate as a motor, due to the current in the series field when the cutout points are closed. Also advise us whether failure of the starting switch to make proper connections between the two halves of the 12-volt battery will prevent the machine operating as a generator. Also state whether the series and shunt field can be tested separately.—A Reader, Glendive, Mont.

1—To assist in explaining the above question we are showing herewith a diagram of the 1916-17 Maxwell car and will give explicit instructions for testing for trouble of this character. First, however, will answer the question as asked. The voltage winding in the cutout, which, by the way, is a combination cutout and regulator, will have no effect on the generator building up. It will, however, allow the generator to build up, but prevent it from automatically becoming connected to the battery, so that under ordinary running conditions the voltage would rise very high and burn up the shunt field. We do not believe that this is your trouble.

Open Shunt Field Possible

The shunt field being opened would give the condition you experienced for the current through the series winding would allow it to operate as a motor, but the machine could not generate without a shunt field. This is, therefore, one possible cause of your trouble, although other causes will be given later. It is not necessary for the starting switch to operate properly in connecting the two halves of the storage batteries in parallel in order to have the machine generate.

The result would be, however, that only one side of the battery would get charged and the other would rapidly run down. Such a condition would not show up on the ammeter, however, as the current indicated will not vary appreciably with the size of the battery. We doubt if it will be feasible to test the shunt windings and series windings separately, as both are grounded, although it can be done if the grounds are accessible so that they can be disconnected.

Systematic Testing

To test this machine in a systematic manner we would proceed as follows: Closing the cutout points allows current to flow from the battery connection at the starting switch through wire No. 6 to No. 6 terminal on the cowl board, then to No. 5 terminal and through the ammeter and back through a heavy connection and series winding in the cutout and across the cutout points to No. 2 terminal. From this point there should be two circuits, one through the No. 2 wire to the rocker ring which carries the three main brushes. The other circuit for field current is from No. 2 terminal on the cowl board across the regulator points, which are mounted on the same device which operates as a cutout, across these points to the No. 3 terminal and through the No. 3 wire to the shunt field connection on the machine.

Our first guess would be that the spring tension is weak on the regulator side of the cutout or that the points are burnt or pitted so that they do not make contact and that, accordingly, you are getting no current through the shunt field. To test for this condition it would be well to take a short piece of copper wire and temporarily short circuit Nos. 2 and 3 terminals on the cowl board which will temporarily eliminate all regulation. You can then start up the engine and close the cutout points by hand if necessary and if speeding up the engine does not cause the ammeter to show charging current then we will have to look farther for the trouble.

Armature May Be at Fault

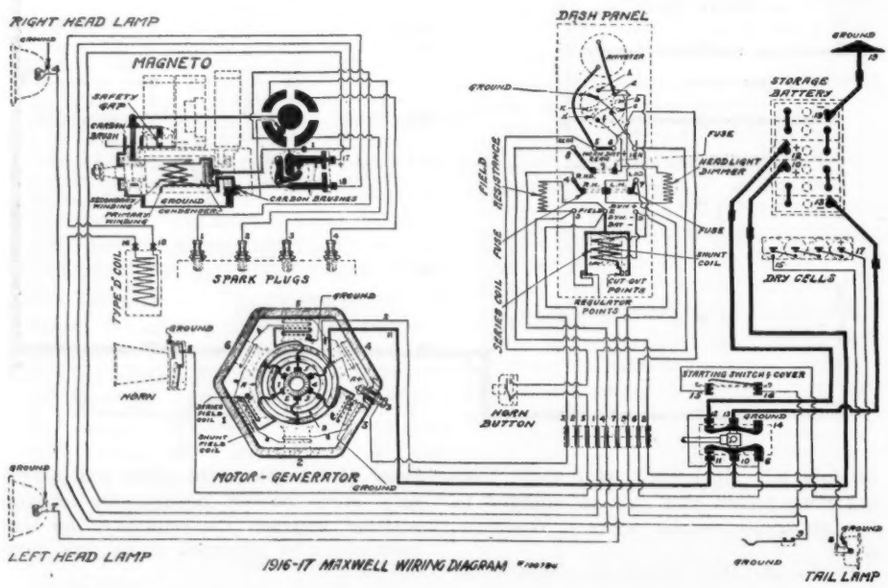
The fact that the machine operates as a motor when the cutout points are closed, shows that the armature and series field circuits are O. K., and, therefore, the No. 2 terminal on the cowl board is O. K. We would, accordingly, suggest temporarily disconnecting the No. 3 wire on the cowl board and, by means of an extra piece of wire, temporarily connecting this No. 3 wire to either the battery terminal, which is No. 6, or to one of the ammeter terminals. Flashing this extension of the No. 3 wire to one of the ammeter terminals will prove that there is some sort of a circuit to the shunt field and on one of the ammeter terminals the amount of current will be indicated.

If the generator is getting field current and armature current and will not generate, it is most likely that there is a defect in the armature. Armature trouble, due to shorts and grounds, will usually show up when the cutout points are closed and the engine is operated. Under these conditions the discharge current will usually decrease from a heavy value down to about zero, but at further engine speed will fail to come across and show up as a charging current, staying at approximately zero. With a good armature the discharge current would rapidly pass the zero point and become a charging current.

Cleaning Regulator Points

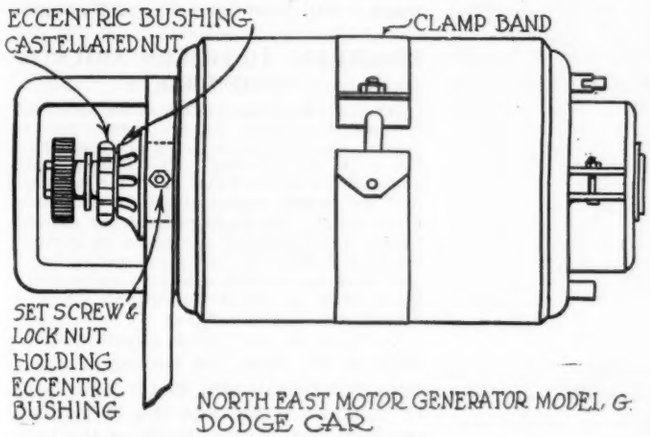
If the generator operates O. K. with Nos. 2 and 3 terminals on the cowl board shorted together, but will not operate with the short circuit removed, it is most likely that the regulator points are not making contact and they should be cleaned with a thin file and then the spring tension adjusted to hold them firmly together. As the generator output increases, however, these points should vibrate to prevent excessive charge to the battery, a current of 12 amperes being approximately correct for average conditions.

If the fine winding or voltage winding of the combination cutout and regulator should be opened it would be noticed that the generator would charge O. K. with the engine running and cutout points held together, but the cutout points would not close by themselves. It would also be noticed that with the engine running and the cutout points held together that there would be no regulation and at high engine speed the ammeter would indicate too much current going to the battery. Summing up the situation the trouble is either in an open circuit at regulator contacts, or in the No. 3 wire to the generator, or in the shunt field of the generator, or in a defective armature, with a faint possibility of trouble in the voltage winding of the cutout.



1916-17 MAXWELL WIRING DIAGRAM

Dodge Noise Due to Generator Chain or Timing Gears


ECCENTRIC BUSHING
CASTELLATED NUT
CLAMP BAND
SET SCREW & LOCK NUT HOLDING ECCENTRIC BUSHING
NORTH EAST MOTOR GENERATOR MODEL G. DODGE CAR

Chain Adjustment Details on Dodge Generator

Q—We have a Dodge car which has been driven nearly 9,000 miles. When driving at speeds slower than 10 or 12 m.p.h., the operation is normal but at speeds of 15 or 20 m.p.h. there is a buzzing noise which is very disagreeable. The motor generator has recently been equipped with a new driving chain which might account for this condition, although it was present to some extent with the old chain. The old chain, when removed, showed considerable wear. Some of the noise is noticeable when the car coasts down hill with ignition shut off, but car driving the engine, clutch being in. No noise is detected when coasting with the clutch thrown out so that the engine is not driven. When driven over 25 m.p.h., this buzzing sound disappears.—Ben F. Gravely, Martinsville, Va.

1—It is possible that the chain is adjusted so that it is too tight which might cause a buzzing sound. A chain which is too loose may also rattle against the chain housing or cause a buzzing noise due to jerking action. The chain should be tightened so that with pressure at the middle it can be made to sag about ½ in. Chain adjustment, as indicated in the figure above, is accomplished by loosening the castellated nut and the set screw, both of which tend to clamp the eccentric bushing. A hammer and drift can then be used to rotate the bushing, which moves the generator toward or away from the engine, thereby loosening or tighting the chain.

If the chain adjustment is at fault and an attempt is made to change it, it would be advisable to back away the supporting vee blocks under the generator.

After the adjustment is completed and the set screw and castellated nut are tightened, it will again be necessary to draw the vee blocks up. It is possible that in installing the new chain that the vee blocks were not properly adjusted and the generator may be held at an angle such that the sprocket on the generator is not in line with the lower sprocket. This is hardly possible, however, as it would involve putting a great strain on the eccentric bushings and end bracket of the motor generator.

In again bringing the vee blocks up into contact with the motor generator it is well to put a piece of tissue paper between the vee blocks and generator and draw them up to the point where the tissue is just pinched so that there will be no danger of cramping the generator out of line. There is another possibility, which has to do with the timing gears, as on some Dodge cars these have been too tightly fitted and cause a noise somewhat like you describe.

To check the condition of the timing gears it will be neccessary to remove the radiator and the front cover of the timing gear housing. It will then be possible to grasp the gear on the camshaft and rock it back and forth, and if there is no preceptible backlash, it is probable that tight gears account for the noise. If this is the case it would be well to install a slightly smaller gear so that there would be some perceptible backlash.

If this is not feasible it will be possible to use grinding compound on the gear teeth, taking care, however, that none of the compound drips down into the engine. With the compression released in all four cylinders the motor should be turned over by hand and the teeth of the gears thereby ground down somewhat. After using this method it is very essential that the gears be washed absolutely clean, taking special pains to prevent the gasoline and grinding compound from working down into the engine.

WHICH IS PREFERABLE, THE FLESH OR HAIR SIDE OF A HIDE?

Q—Clutches are refaced with the flesh side of the leather to the flywheel. There are good reasons for this and there are good reasons for putting the hair side to flywheel. Maybe you can tell the right way and what will happen the wrong way. I put one in myself with the flesh side to the flywheel and no amount of fuller's earth would make it hold very long at a time. Which is right and why?—Arthur B. Cross, Grand Rapids, Mich.

1—The correct way to install leather on a clutch cone is to have the flesh side of the leather to the outside. The flesh side of the leather is used for the same reason that you would not use the outside bark of a tree, but would use the inside if it were to be used for a clutch facing. When used as a facing for a clutch, the hair side of leather, if used for the outside, would tend to tear out that is, the grain structure is such that it would be inclined to peel or tear at certain places and the leather would not make perfect contact with the flywheel.

This is the opposite practice from what is used in belting work. Where leather belts are used it is the usual practice to place the hair side to the pulley. First, because it is smoother and secondly, because the wear is being taken on a part of the belt which intrinsically does not provide the majority of the belt strength. The coefficient of friction of the two sides are approximately the same but the surface of the flesh side will stand considerable more slippage without breakdown of the structure than will the hair side.

A LEATHER PLUG HIDES DYNETO GENERATOR ADJUSTMENT

Q—We would like some data on the Dyneto generator used on 1917 Crow Elkhart car. This generator has third brush regulation, but we have been unable to find out just where the adjustment screw is located. This generator does not charge enough and we would like to have a diagram of the internal circuit. Also information on adjusting current output.—Roy E. Gum, Wray, Colo.

1—Internal circuits of the Dyneto generator used on Crow Elkhart car are shown below. Third brush generators made by the Dyneto people have been made in two ways, an older type having no adjustment and a newer type which does have an adjustment. On the older type to raise the output it is necessary to bevel off the corner of the third brush where the commutator first makes contact. Note that if the wrong corner of the brush is beveled, where the commutator comes out from under the brush that the current output will be reduced instead of increased.

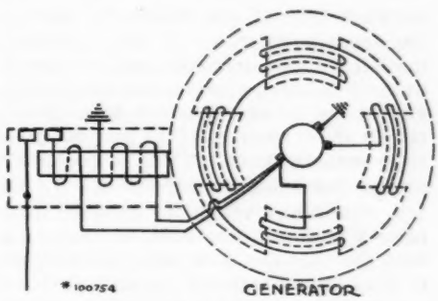
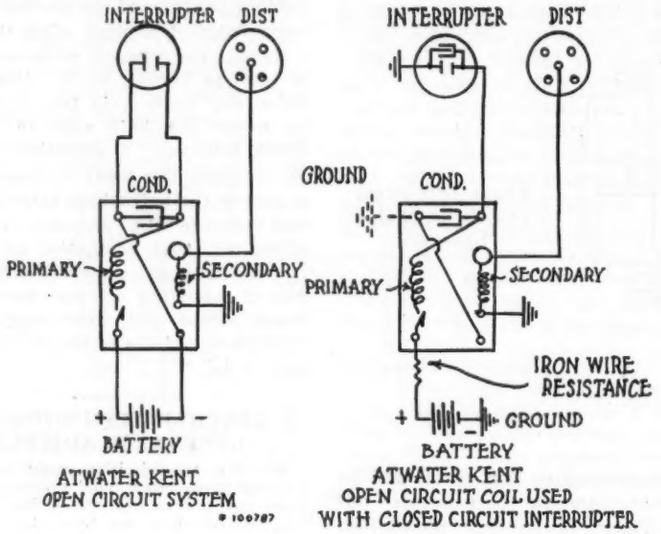


Diagram of Dyneto generator

On later type third brush generators the adjusting screw is covered up by a leather plug, which may not be visible on casual inspection. This leather plug is located on the outside of the end bracket and should be removed and the adjusting screw loosened. The third brush can then be shifted to the proper position, the screw tightened and the plug replaced.

To increase the charging rate, it is always necessary to move the third brush in the direction of rotation, while to reduce the current going to the battery, movement in the opposite direction is required. This fact should be remembered in making adjustments.

An Open Circuit Coil With a Closed Circuit System



Q—Advise how we may use an "A-3" Atwater-Kent coil on a Ford that is equipped with Atwater-Kent "L A" system. We realize that this coil is designed for an open circuit system but thought it might be used. It has three leads besides the high tension terminal, also two which are marked "O" and "I," these being the battery connections. What is the cause of this system showing 8 amperes discharge when it is only supposed to draw 3 amperes. We have it at present connected up with a regular Ford coil unit which has a resistance in series with it.—A. L. McKinney, Seymour, Ind.

1—We believe that you should have good results from using the Atwater Kent LA system, with a standard Ford coil with resistance, as this method also makes three spare coils available for use in an emergency.

In the diagrams herewith we have shown a type of coil which we hope is the one you refer to. In the sketch at the left we have this coil, first connected to the regulation open circuit interrupter and at the right connected to a closed circuit interrupter. Before you can possibly connect the coil it will be necessary to find out what is inside of it. To do this you can wire up an ammeter and battery with two test leads so connected that shorting the leads together will put a short circuit through the ammeter. Of course, this would be destructive to the meter if continued for any length of time so that in testing this way you should carefully flash all connections instead of leaving them for even a second or two.

You can now test out the coil from the battery connection to the interrupter connections at the other side and we believe you will find in one case a short circuit, as indicated in the left hand sketch, by a line running diagonally across the coil box. We believe that diagonally the other way you will find there is a primary winding drawing 10 or 12 amperes when the switch is closed but when the switch is opened there will be no connection. To see whether there is a condenser or not in the coil, it will be necessary to use 110 volt test.

To arrange this test you will need one lead connected directly to the 110 volt circuit and another lead connected through a lamp to the 110 volt circuit. In this way your test points can be touched together and the only result will be to light up the lamp. These two test points should now be touched together in the air and the condition of spark noticed. They should then be put in contact with the interrupter terminals, across which we have shown a condenser connected. While still in contact with these terminals they should be brought in contact with each other and if the spark is much snappier and louder than when the points are touched in the air it shows that a condenser is built into the coil.

Referring now to the right hand sketch in the diagram we have shown, one side of the battery grounded, which is now customary, and the other side of the battery connected to an iron wire resistance then through the primary winding and switch of the coil box to the live side of the interrupter. If the interrupter has a condenser of its own the condenser in the coil box will not be required and the ground connections, shown dotted, will not be needed. However, if the interrupter flashes considerable at the points it would do no harm to try a ground wire as shown by the dotted lines, as this will reduce the flashing in the interrupter, although it may possibly cause the spark to miss at very high speeds. There will be no difference in the secondary connections in the two systems.

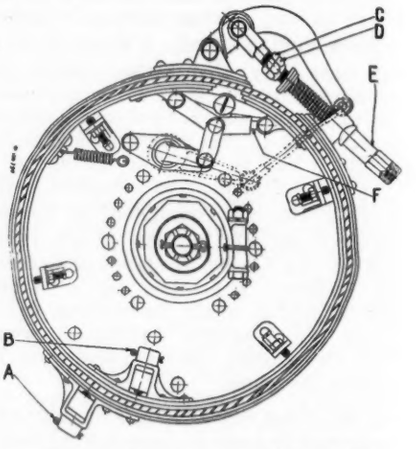
Your remark in regard to the 8 amperes and 3 amperes discharge is approximately correct, although we usually consider that an open circuit coil draws 10 amperes when the contacts are held closed and that a closed circuit coil draws about 5 amperes. This does not mean that under continued operation this much current is drawn from the battery, as the opening and closing of the contacts cuts down this value considerably. In determining the amount of iron wire resistance we would, therefore, suggest that this be varied until the coil draws about 5 amperes with the points held together. Under normal operating conditions it will then draw 1½ or 2 amperes.

PROCEDURE TO FOLLOW ADJUSTING VELIE BRAKES

Q—Give us information on adjusting the brakes of a Velie Model 6-48. The external brakes have been relined three times in six months. The owner claims the brakes never have operated properly, and he could never stop the car in an emergency. We have relined the external brake and adjusted the same in different ways, but they do not stop the car properly and the linings which were removed, were still in good condition.—Chas. F. Henderson, Cleveland, O.

1—There is not much question in our opinion but what the trouble is due to improper adjustment, as the axle is one of standard make, and should give perfect satisfaction. A sketch of the brake is shown herewith and the process of adjusting is as follows: First, make sure that with the brake pedal released, that is in the up position that the brake rods are loose. By this, we mean that the brakes should not be held by the rods when in the release position.

The levers on the cross shaft on the rear axle should also be released as much as possible. The adjustment of the external brake is then accomplished by first removing cotterpin A and turning the screw that it holds until the clearance between the drum and brake band is approximately 1/64 inch. In other words, the brake drum should just barely clear the lining when revolved.



Brake adjustment on Velie 6-45

It is very important to make this adjustment at the side of the brake away from the operating mechanism before making any other adjustment and it is possible that your trouble is due to incorrect setting at this point. After this adjustment has been made, so that the brake drum barely clears the band it will be in order to adjust the lower half of the brake band, shown at the left.

This is accomplished by loosening the jam nut C and turning nut D until the lower half of the brake band just clears the drum by 1/64 inch all around. Jam nut C can then be tightened in order to lock nut D. In order to adjust the upper half of the brake drum, turn out

(Continued on next page)

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E until there is 1/64 in. between the lining and upper portion of the drum. With this adjustment, there should be no trouble whatever in stopping the car.

Adjusting of the internal brake is as follows: Turn the adjusting screw held by cotter pin B until there is 1/64 in. clearance between the internal lining and the brake drum. In case the brake band is badly worn and further adjustment is required, remove clevis pin holding F in position and turn screw to the left until brake band is approximately 1/64 in. away from drum. In your particular case we doubt if adjustment of F will be required, as you state that new lining has recently been installed.

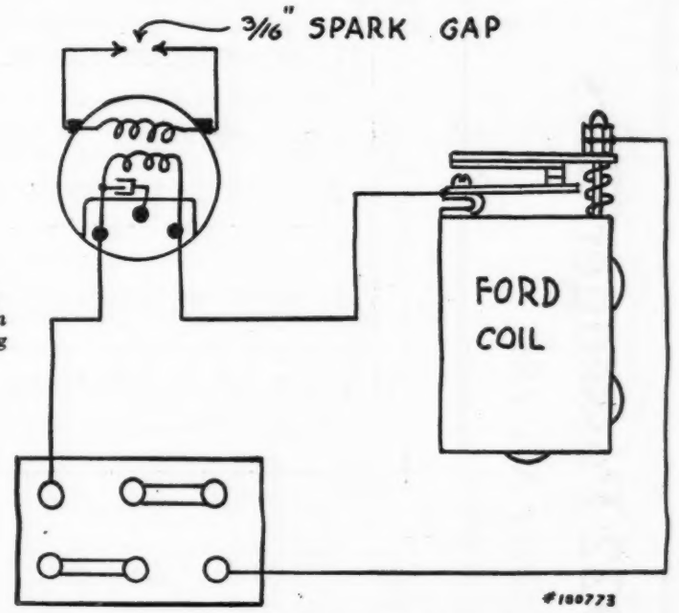
Wants to Have Ignition Coils Rewound

Q—Where can we send Connecticut ignition coils to be rewound and fixed up. We have a couple dozen of them here and if it is worth while to have them repaired would like to have the work done. Advise some concern that can handle this work. —L. J. Peterson, care Automotive Co., Isabel, S. D.

There are two things that can go wrong with an ignition coil such as the Connecticut, which has the condenser built in. One is a short in the secondary winding, which means that the paper between layers of fine wire is punctured or burnt. In this case the coil is not capable of being repaired. Another trouble may be encountered in the condenser, which is comparatively inexpensive and easy to replace. Before either attempting to repair these coils yourself or shipping them out to be repaired it would be best to make a test on them to see whether the trouble is in the condenser or in the winding itself.

The best way to test these would be to take a 6-volt battery and connect wires to the two battery terminals and use these to test the coil. We assume that you refer to the older type Connecticut coil, which is shown in the upper left-hand portion of the diagram above. With the battery wires test out the three terminals in the depressed portion of the top of the coil to see which is the primary. This will be at the two terminals where you get a good connection or flash as the circuit is made and broken. The only other thing you need to test with is a Ford coil which is known to be in good condition, as this scheme of testing will make use of the vibrating points and the condenser of the Ford coil but will not use its windings.

Having found the terminals which connect to the primary of the Connecticut coil, you will make a connection from battery to the Connecticut coil then from the Connecticut coil to the Ford coil and from the Ford coil back to battery. Note specifically that the regulation terminals on the Ford coil will not be used. Having made the connections as shown and also having provided a 3/16 spark gap as indicated in the diagram, next operate the vibrator of the Ford coil with the fingers or with a pencil, snapping the points open rapidly. At every opening of the Ford interrupter points there should be a spark in the 3/16 gap. Inasmuch as we are not using the regular condenser in the Connecticut coil, any difficulty in getting a good spark at the gap will show that the Connecticut coil is defective as far as the winding is concerned and there is no object in trying to repair it.

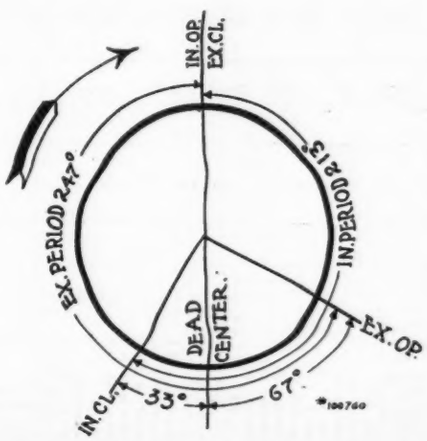


Testing connecting coil to locate defect in condenser or winding

On the other hand, if good sparks are obtained at the 3/16 spark gap and in regular service the coil will not operate, it is quite evident that its condenser is defective. Having found out the coils which are giving trouble due to defective condensers, there are two possibilities. *One is to send them to some reliable concern, names of which will be given by* separate letter, and another is to undertake replacing the condensers yourself. In the diagram the old type Connecticut placement is very easy.

In the older type Connecticut coil there is a tin cover on the bottom which can be removed by knocking out the three pins. To do this, take a file and clean off the paint from the side of the tin can type cover so that the three pins can be seen. Then with a small punch drive these into the coil, where they will lodge in the compound and do no harm. The coil is indicated, but since it was put on the market two other types have been developed, one having a porcelain top in which it is hardly advisable to try to replace even the condenser, and another having a detachable condenser where retin cover can then be removed, after which it will be found that the condenser *is very accessible and can be unsoldered* and a new one put in. The price of new condensers is approximately 90 cents, from which price a regular garage or dealer would be entitled to approximately 25 per cent discount, so that if the work could be done by you it would no doubt pay to fix up the coils.

On the other hand, there would be a labor charge of possibly two or three dollars in addition to the cost of the condenser, and on top of this you would have to add transportation charges, so that you can use your own judgment comparing this cost for repairing with the cost of a new coil. The decision will rest, of course, on whether you have a man who, with the instructions here given, is capable of going ahead with the work. As the amount involved is not very much, we would suggest your trying repair on one coil, at least to the extent of testing *it out and removing the old condenser.*



FIRING ORDER 1-5-3-6-2-4

VALVE TIMING OF CONTINENTAL 7 W

Q—We found at your suggestion, the wheels and pinion loose on the D, 35. We have an Elcar with a 7-W Continental engine, which won't run but 35 m.p.h. Timing is according to flywheel, but we don't know whether flywheel has been removed or not. The pistons are slightly heavier than the old ones. Give us the correct timing of this engine.—Painter's Garage, Darlington, Ind.

1—Firing order of the 7W Continental engine is 1, 5, 3, 6, 2, 4. The valve timing diagram is shown at the left. It will be seen by reference to this diagram that the intake valve opens and the exhaust valve closes simultaneously on upper dead center.

Hose and Tubing Sizes for 1922 Passenger Cars

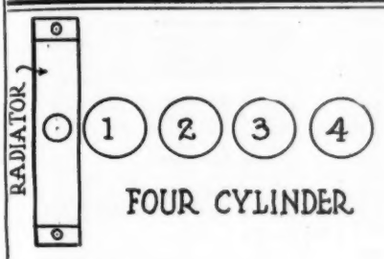
Motor Age Maintenance Data Sheet No. 184

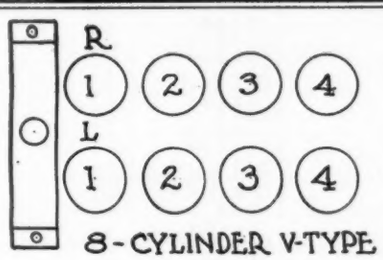
NAME AND MODEL	RADIATOR HOSE						TUBING (Outside Diameter)	
	UPPER			LOWER				
	Number of Pieces	Length	Diameter (Inside)	Number of Pieces	Length	Diameter (Inside)	Gasoline Line	Oil Line
Ace, F	1	3¾	2¼	2	4	2¼	5/16	¼
Ace, C	1	12	1¼	1	10	1¼	5/16	¼
Ace, L	1	10	1¼	1	8½	1¼	5/16	¼
Ambassador, R	1	6	1½	1	9	1¼	5/16	
American, C	1	15½	1½	1	8½	1¼		
Anderson, 40	1	10	1¼	1	9½	1¼	5/16	5/16
Apperson, 8	1	12	3	2	16¾	2	5/16	5/16
Auburn, 6-51		7½	1¼		14	1¼	5/16	¼
Biddle, B1 & B5	1	4½	2⅛	1	5	1⅝	5/16	
Brewster, 02	1	2⅞	1⅞	1	9	1⅞	5/16	
Buick, Six	1	8	1¼, 1⅜	2	15¾, 2⅝	1¼		
Buick, Four	2	4½	1⅜	1	8	1⅜		
Cadillac, 61	Special						½	⅝
Case, X	1	5	1¼	1	10¾	1¼	5/16	5/16, ¼
Case, V	1	9	1½	1	6¾	1½	5/16	5/16, ¼
Chandler, 1922	1	10½	1⅜	1	8⅞	1⅜	5/16	½, ¼
Chevrolet, 490	1	4⅝	1¼	1	3⅝	1¼		
Chevrolet, FB								
Cleveland, 40	1	3½	1¼	1	6½	1¼	5/16	¼, ⅜
Cole, 870	2	22½	1½	1	3¾	1¼	5/16	⅜, 5/16
Columbia, Challenger	2	2¼, 3½	1¼, 1¼	1	13	1¼		
Comet, C53-2	1	8½	1½	1	10	1¼		
Crawford	1	10½	1¼	1	10½	1¼		
Cunningham, B-4	2	5½	1¼	2	3⅝	1¼	5/16	5/16
Daniels, D19	1	6	1¾	1	8⅝	1¾		
Dixie Flyer, H	1	14	2	1	17	2	5/16	5/16
Dodge Brothers	1	7	1½	1	7¼	1⅝	¼	¼, 5/16
Dorris, 6-80	1	2¼	1½	2	6¼	1¼		
Dort, 19	1	6	2¼	1	14¼	2¼	5/16	¼
Duesenberg	1	8	1½	2	5	1½		
Durant, A-22		5	1¼		15	1¼	5/16	5/16
Durant, B-22	1	5¼	1¼	1	5¼	1¼	5/16	5/16
Earl, 40	1	5	1⅝	2	5	1⅝		
Elcar, K-4		11	2⅜		19	2⅜	¼	5/16
Elcar, 7-R		4	1¼		12	1¼	5/16	¼
Elgin Six, K-1	1	7½	1⅞	1	15⅝	1⅞	5/16	¼
Essex	1	4	2¼	1	14½	2½	⅜, ¼	⅜
Ford, T	1	4	2	2	2¾	1¾		
Franklin, 9-B	None			None			⅜	¼
Gardner	1	9½	2¼	1	15	2¼		
Grant	1	8	2¼	2		2¼		
H. C. S	1	6 11/16	1¾	1	3¼	1¼		
Halladay, Four	1	12	2¼		21½	1½		
Halladay, Six		15	1½		15	1		
Hatfield, A-42	1	11	2	1	15	2		
Handley-Knight, B	1	5½	2¾	1	5½	2¾		
Hanson, 60	1	9½	1	1	12½	1	5/16	¼
Haynes, 55	1	14½	1¼	2	2¾, 12½	1¼, 1½		
Haynes, 75	1	8⅞	1¼	2	2⅞, 10¾	1¼, 1½		
Holmes, 4	None			None			5/16	¼, ⅜
Hudson, Super 6	1	3⅝	1½	1	9¼	1½	⅜, ¼	⅜
Hupmobile, R	1	10⅝	2¼	1	9 1/16	2	5/16, ⅜	½, 5/16
Jewett, 6	1	11½	1½	2	2½, 6	1⅛ 1⅛	5/16	½, ⅜
Jackson, 638	1	12	1½	1	9	1¼	5/16	5/16
Jordan, MX	1	9½	1¼	1	12½	1¼	5/16	⅜, ¼
King, 8	2	7½	2¼	2	3½	1¾		
Kissel	1	8⅝	1¼	1	10 11/16	1¾		
Kline, 6-55-K	1	7½	1¼	1	16	1¼	5/16	¼
LaFayette, 134		6	1⅛	2	4½, 2½	1¼, 1¼	¼	5/16
Leach, 999	1	5¼	1¾	1	6¼	1¾		
Lexington, ST-22		7	1¼		6	1¼	5/16	¼
Lexington, T-22		7	1¼		6	1¼	5/16	¼

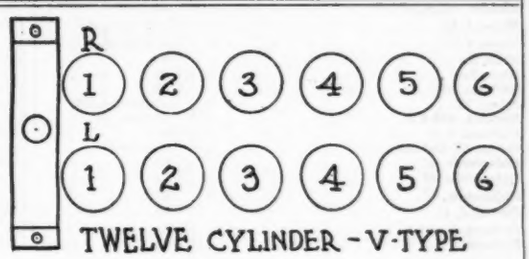
NAME AND MODEL	RADIATOR HOSE						TUBING (Outside Diameter)	
	UPPER			LOWER				
	Number of Pieces	Length	Diameter (Inside)	Number of Pieces	Length	Diameter (Inside)	Gasoline Line	Oil Line
Liberty, 10-D	1	6	2	1	13½	2	5/16	5/16
Lincoln	1	16¼	1¾	1	11¼	1¾		
Locomobile, 48	1	2¾	1⅜	1	5	1⅜		
Maibohm, B	1	13	1⅞	1	6	1⅞		
Marmon, 34	1	3⅞	1¼	1	3⅞	1¼		
Mercer, Series 5	1	8¾	1 11/16	1	14½	1 11/16	5/16	5/16
McFarlan, T. V	1	3½	2	1	9¾	1¼	5/16	5/16, 5/8
Merit, B. & C	1	7	1¼	1	7	1¼		
Mitchell	1	5⅜	1½	1	7¾	1⅛		
Monroe	1	5	2	1	15½	1¾	5/16	5/16
Moon, 6-40	1	14	1¼	2	6	1¼	5/16	¼
Moon, 6-48	1	10	1¼	1	12	1¼	5/16	¼
Nash, 691-7	1	4½	1½	1	4	1¼	5/16	¼
Nash, 41-4	1	6½	1½	1	3¼	1½	5/16	¼, 5/16
National, BB	1	(el)	1½	1	13	1½	5/16	¼
Norwalk, 430-KS		9½	2⅜		19	2¾		
Oakland, 6-44	1	16¼	1¼	2	3⅞	1	¼	5/16
Ogren, Six	1	6	1¼	1	12	1¼		
Oldsmobile, 43A	1	6½	1¼	1	10½	1¼		
Oldsmobile, 46	2	14¾	1⅜	2	6¼	1¼		
Oldsmobile, 47	2	12½	1¼	2	3½	1		
Overland, 4		6	2		10	1¾	5/16	
Packard, 116	1		1¾	1	6¾	1½	5/16	¼
Packard, 335	1	8½	1½	1	8	1⅝	5/8	¼
Paige, 6-66	2	4, 5½	1 1/16, 1 7/16	2	3	1¼		
Paige, 6-44	1	9½	1½	1	10½	1⅛		
Paterson, 6-22-52	1	7¼	1¼	1	13	1¼		
Peerless, 56	2	7	1 13/32	1	5½	1 13/32		
Pierce-Arrow, 33	1	3	2	1	14¼	1½	3/8	5/16
Pilot, 6-50	1	10	1½	1	7	1¼	5/16	5/16
Premier, 6-D	1	5¾	1¼	1	8¾	1¼	5/16	5/16
R. & V. Knight, R	1	9¾	2¼	1	16	2	5/16	3/8
R. & V. Knight, J	1	10 5/16	2½	1	17½	2¼	5/16	3/8
Reo, T6	1	12	1½	1	8¾	1¼	¼	¼
Revere		9	1½		7	1½	5/16	¼
Rickenbacker, A	1	9¾	1	1	14¾	1	5/16	⅜, ¼
Roamer, 4-75-E	1	7	1½	1	13	1½	⅜, 5/16	5/16
Roamer, 6-54-E	1	13	1½	1	13	1¼	5/16	5/16
Rolls Royce	1	5	1½	1	1 15/16	1½	5/16, 5/16	
Saxon, 125 G		4⅝	2 5/16		10½	2 5/16		
Sayers Six, DP	1	12	1¼	1	12	1¼	¼	¼
Seneca, L2 & O2	1	11	2¼	1	17	2¼	¼	5/16
Seneca, 50	1	10	2¼	1	17	2¼		
Standard, 8	2	6½	1¾	1	6¼	1¾		
Stanley, 735							5/16	5/16
Stanwood, Six	1	7½	1¼	1	9½	1¼		
Stearns-Knight	1	6⅝	1⅜	2	9, 2½	1⅜, 1⅜		
Stephens, 90	1	11¾	2¼	1	17⅝	2¼	5/16, ¼	5/16
Stevens-Duryea	1	4¾	1½	1	4 1/16	1½		
Studebaker, L6	1	5¼	1	1	2½	1	¼	5/16
Studebaker, S6	1	9½	1½	1	8¾	1½	¼	5/16
Studebaker, B6	1	9½	1½	1	8¾	1½	¼	5/16
Stutz, K	1	8	2	1	15	1¼	⅜	¼
Templar, 445		9¼	1½		7¾	1¼	5/16	5/16
Tulsa, E-1-2-3	1	12¼	2	1	17	2	5/16	
Velie, 58	1	7	2¼	1	12¾	2¼		
Velie, 48		10½	1¼		9	1¼	5/16	⅜
Velie, 34		8	2¼		13½	2¼	⅜	⅜
Washington, 6	1	3½	1¼	1	13	1¼	5/16	¼
Westcott, A-44	1	8	1¼		12	1¼	¼	¼
Westcott, C-48	1	9	1½	1	2⅞	1¼	5/16	¼
Wills Sainte Claire	2	5¾	2¼	2	5⅛	2		
Willys-Knight, 20A		3	2 5/16		5½	2¼	5/16	¼

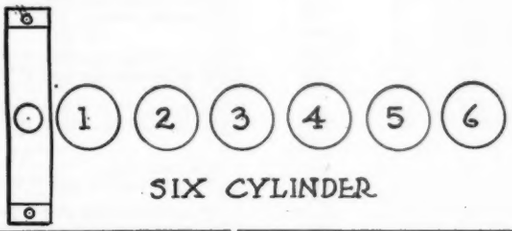
Firing Order and Ignition Timer for 1922 Passenger Cars

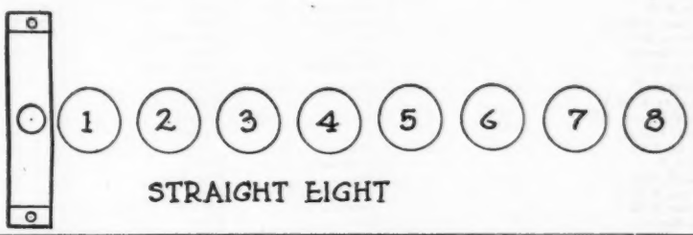
Motor Age Maintenance Data Sheet No. 185











MAKE AND MODEL	ENGINE MAKE	IGNITION MAKE	FIRING ORDER	BREAKER POINTS OPENING	SPARK FULLY RETARDED BREAKER POINTS OPEN
Ambassador, R	Continental, 6T	Bosch	1-5-3-6-2-4	....	On top dead center
American, C	H-S, 11,000	Atwater-Kent	1-4-2-6-3-5	.006"	¾" on Flywheel Rim after T. D. C.
Anderson, Series 40	Continental, 7R	Remy	1-5-3-6-2-4	.020"	On top dead center
Apperson, Eight	Own	Remy	1L-2R-3L-1R-4L-3R-2L-4R	....	On top dead center
Auburn, 6-51	Continental, 7R	Remy	1-5-3-6-2-4	.020"	1¹³⁄₁₆" on Flywheel Rim after T. D. C.
Bay State	Continental	Delco	1-5-3-6-2-4	.020"	On top dead center
Biddle, B1 and B5	Buda, WU	Simms	....	.014"	
Brewster, 91	Own	Bosch	1-3-4-2	.020"	On top dead center
Buick, 44-48-9-50	Own	Delco	1-4-2-6-3-5	.020"	1" on Flywheel Rim after T. D. C.
Buick, 34-37	Own	Delco	1-3-4-2	.020"	15⁄16" on Flywheel Rim after T. D. C.
Cadillac, 61	Own	Delco	1L-2R-3L-1R-4L-3R-2L-4R	.020"	Before top dead center
Case, X	Continental, 7R	Delco	1-5-3-6-2-4	.021"	On top dead center
Case, W	Continental	Delco	1-5-3-6-2-4	.020"	On top dead center
Chalmers	Own	Remy	1-4-2-6-3-5	.020"	1½" on Flywheel Rim after T D. C.
Chandler, 1922	Own	Bosch	1-5-3-6-2-4	.015"	On top dead center
Chevrolet, Superior	Own	Remy	1-2-4-3	.025"	On top dead center
Chevrolet, FB	Own	Auto Lite	1-2-4-3	....	
Cleveland, 41	Own	Bosch	1-5-3-6-2-4	.018"	On top dead center
Cole, 890	Northway	Delco	1R-4L-3R-2L-4R-1L-2R-3L	....	
Columbia, DeLuxe	Continental, 7R	Atwater-Kent	1-5-3-6-2-4	....	On top dead center
Columbia, Light Six	Continental, 6Y	Auto Lite	1-5-3-6-2-4	....	
Comet, C-53	Continental, 9N	Wagner	1-5-3-6-2-4	....	On top dead center
Courier	Falls	Atwater-Kent	....	....	
Crawford, 22-6-60	Continental, 9N	Bosch	1-5-3-6-2-4	....	On top dead center
Crawford-Dagmar	Continental, 9N	Bosch	1-5-3-6-2-4	....	On top dead center
Cunningham, V-4	Own	Delco	1R-4L-3R-2L-4R-1L-2R-3L	....	
Daniels, D19	Own	....	1L-2R-3L-1R-4L-3R-2L-4R	.018"	
Davis, 71	Continental	Delco	1-5-3-6-2-4	....	On top dead center
Davis, 61-67	Continental, 7R	Delco	1-5-3-6-2-4	....	On top dead center
Dixie Flyer, H-S-70	H-S, 7,000	Eiseman	1-3-4-2	.015"	1¾" on Flywheel Rim before T. D. C.
Dodge Brothers	Own	North East	1-3-4-2	....	
Dorris, 6-80	Own	Bosch	1-5-3-6-2-4	....	
Dort, 19-14	Lycoming	Connecticut	1-3-4-2	.020"	On top dead center
Duesenberg, Straight 8	Own	Delco	1-5-3-7-4-8-2-6	....	
DuPont, A	Own	Eiseman	....	....	
Durant, A-22	Continental	Auto Lite	1-5-3-6-2-4	.018"	On top dead center
Durant, B-22	Ansted	Auto Lite	1-5-3-6-2-4	....	On top dead center
Earl, 40	Own	Connecticut	1-3-4-2	....	
Elcar, K-4	Lycoming, K	Delco	1-3-4-2	.020"	On top dead center
Elcar, 7-R	Continental, 7R	Delco	1-5-3-6-2-4	.020"	On top dead center
Elgin, K-1	Falls	Wagner	1-4-2-6-3-5	.021"	5⁄8" on Flywheel Rim after T. D. C.
Essex	Own	Bosch	1-3-4-2	.018"	On top dead center
Ford, T	Own	Own	1-2-4-3	....	
Franklin, 9-B	Own	Atwater-Kent	1-4-2-6-3-5	.007"	1¹⁄₁₆" on Flywheel Rim before T. D. C.
Gardner, T, R & G	Lycoming, K	Westinghouse	1-3-4-2	.012"	On top dead center
Grant	Own	Atwater-Kent	1-4-2-6-3-5	.015"	
H. C. S.	Weidley	Delco	....	....	
Handley-Knight	Own	Auto Lite	1-3-4-2	.020"	
Hanson, 30	Continental, 6Y	....	1-5-3-6-2-4	.020"	On top dead center
Hanson, Six	Continental, 7R	Delco	1-5-3-6-2-4	020"	On top dead center
Hatfield, A-42	H-S, 7.000	Connecticut	1-3-4-2	.016"	17⁄64" on Flywheel Rim after T. D. C.
Haynes, 75	Own	Kingston	1-4-3-6-2-5	.018"	5⁄8" on Flywheel Rim after T. D. C.
Haynes, 55	Own	Kingston	1-4-3-6-2-5	.018"	5⁄8" on Flywheel Rim after T. D. C.
Helmes, Series 4	Own	Eiseman	1-4-2-6-3-5	.012"	9¼° before top dead center
Hudson, Super 6	Own	Bosch	1-5-3-6-2-4	.018"	On top dead center
Huffman	Continental	....	1-5-3-6-2-4	.020"	On top dead center
Hupmobile, R	Own	Atwater-Kent	1-2-4-3	.008"	5° after top dead center
Jackson, 638	Continental, 7R	Remy	1-5-3-6 2-4	.020"	2° after top dead center
Jewett, Six	Own	Atwater-Kent	1-5-3-6-2-4	.015"	1¼" on Flywheel Rim after T. D. C.
Jordan, MX	Own	Delco	1-5-3-6-2-4	.022"	4¹⁵⁄₁₆" on Flywheel Rim before T.D.C.
Kelsey, 4	Gray	Bosch	....	....	
King, K	Own	Atwater-Kent	1R-4L-3R-2L-4R-1L-2R-3L	.018"	¾" on Flywheel Rim after T. D. C.
Kissel, 45	Own	Remy	1-5-3-6-2-4	.025"	¾" on Flywheel Rim after T. D. C.
Kline Kar, 6-55-K	Continental, 7R	Connecticut	1-5-3-6-2-4	.020"	On top dead center
LaFayette, 134	Own	Delco	....	.015"	12° after top dead center
Leach, 999	Own	Delco	1-5-3-6-2-4	.018"	1¼" on Flywheel Rim after T. D. C.
Lexington, 23	Ansted	Connecticut	1-5-3-6-2-4	.015"	On top dead center
Liberty, 10-D	Own	Warner	1-4-2-6-3-5	.023"	
Lincoln	Own	Delco	1R-4L-2R-3L-4R-1L-3R-2L	....	
Locomobile, 48	Own	Berling	1-5-3-6-2-4	.018"	
Marmon, 34	Own	Delco	1-5-3-6-2-4	.018"	
Maxwell	Own	Simms	1-3-4-2	....	
McFarlan, 1922	Own	Berling	1-5-3-6-2-4	.012"	¾" on Flywheel Rim after T. D. C.

MAKE AND MODEL	ENGINE MAKE	IGNITION MAKE	FIRING ORDER	BREAKER POINTS OPENING	SPARK FULLY RETARDED BREAKER POINTS OPEN
Mercer, Series 5	Own	Eiseman	1-3-4-2		
Merit	Continental, 7R	Delco	1-5-3-6-2-4	.023"	On top dead center
Mitchell, F-50	Own	Remy	1-5-3-6-2-4	.022"	
Monroe, 1922-S-9	Own	Connecticut	1-3-4-2	.015"	On top dead center
Moon, 6-40	Continental, 6Y	Delco	1-5-3-6-2-4	.020"	On top dead center
Moon, 6-58	Continental, 7R	Delco	1-5-3-6-2-4	.020"	On top dead center
Nash, Six	Own	Delco	1-5-3-6-2-4		On top dead center
Nash, Four	Own	Delco	1-3-4-2	.015"	On top dead center
National, BB	Own	Delco	1-5-3-6-2-4	.015"	
Noma, 3C	Continental, 7R	Delco	1-5-3-6-2-4	.020"	On top dead center
Norwalk, 430-KS	Lycoming, K	Delco	1-3-4-2	.020"	On top dead center
Oakland, 6-44	Own	Remy	1-5-3-6-2-4	.025"	On top dead center
Ogren, 6T DeLuxe	Continental	Bosch	1-5-3-6-2-4	.020"	On top dead center
Oldsmobile, 43A	Own	Remy	1-3-4-2	.016"	On top dead center
Oldsmobile, 46	Own	Delco	1R-4L-3R-2L-4R-1L-2R-3L	.018"	
Oldsmobile, 47	Own	Delco	1R-4L-3R-2L-4R-1L-2R-3L	.018"	On top dead center
Overland, 4	Own	Connecticut	1-3-4-2	.018"	3½" on Flywheel Rim before T. D. C.
Packard, Single 6	Own	Delco	1-5-3-6-2-4	.020"	
Packard, Twin Six	Own	Delco	1R-6L-4R-3L-2R-5L-6R-1L-3R-4L-5R-2L	.020"	
Paige, 6-44	Own	Atwater-Kent	1-5-3-6-2-4	.006"	1½" on Flywheel Rim after T. D. C.
Paige, 6-66	Continental, 8AP	Atwater-Kent	1-5-3-6-2-4	.006"	1⅝" on Flywheel Rim after T. D. C.
Paterson, 6-22-52	Continental, 7R	Delco	1-5-3-6-2-4	.018"	On top dead center
Peerless, 56 S-7	Own	Atwater-Kent	1R-4L-3R-2L-4R-1L-2R-3L	.015"	
Pierce-Arrow	Own	Delco	1-5-3-6-2-4		
Pilot, 6-50	H-S, 11,000	Connecticut	1-4-2-6-3-5	.021"	2¾" on Flywheel Rim before T. D. C.
Premier, 6-D	Own	Delco	1-5-3-6-2-4	.018"	1⅞" on Flywheel Rim after T. D. C.
Premocar, 6-40-A	Falls	Wagner			
R. & V. Knight, R	Own	Wagner	1-3-4-2	.031"	2" on Flywheel Rim after T. D. C.
R. & V. Knight, J	Own	Wagner	1-4-2-6-5-3	.031"	3" on Flywheel Rim after T. D. C.
Reo, T6 & U6	Own		1-4-2-6-3-5	.020"	
Revere, C	Duesenberg	Bosch	1-3-4-2	.017"	
Rickenbacker, A	Own	Auto Lite	1-4-2-6-3-5	.018"	On top dead center
Roamer, 6-54-E	Continental, 9N	Bosch	1-5-3-6-2-4	.017"	¼" on Flywheel Rim after T. D. C.
Roamer, 4-75-E	Duesenberg	Splitdorf	1-3-4-2	.017"	
Rolls Royce	Own	Bijur	1-4-2-6-3-5	.020"	1½" on Flywheel Rim after T D. C.
Saxon, 125	Own	Wagner	1-3-4-2	.028"	On top dead center
Sayers Six, DP	Continental, 7R	Delco	1-5-3-6-2-4	.027"	1⅛" on Flywheel Rim after T. D. C.
Seneca, L2 & O2	Lycoming, L	Auto Lite	1-3-4-2	.027"	¼" on Flywheel Rim after T. D. C.
Seneca, 50 & 51	Lycoming	Auto Lite	1-3-4-2		¼" on Flywheel Rim after T. D. C.
Sperling, A	Supreme, S-4	Splitdorf	1-3-4-2	.018"	On top dead center
Standard, 98	Own	Splitdorf	1R-1L-3R-3L-4R-4L-2R-2L		On top dead center
Stanwood Six	Continental, 7R	Atwater-Kent	1-5-3-6-2-4	.006'	On top dead center
Stearns-Knight, 4	Own	Atwater-Kent	1-3-4-2	.025"	¾" on Flywheel Rim after T. D. C.
Stephens, 90	Own	Connecticut	1-4-2-6-3-5	.020"	¼" on Flywheel Rim after T. D. C.
Stevens-Duryea, E	Own	Berling			
Studebaker, EJ	Own	Remy	1-4-2-6-3-5	.020"	3/16" on Flywheel Rim after T. D. C.
Studebaker, EL	Own	Remy	1-5-3-6-2-4	.020"	1/16" on Flywheel Rim after T. D. C.
Studebaker, EK	Own	Remy	1-5-3-6-2-4	.020"	½" on Flywheel Rim after T. D. C.
Stutz	Own	Delco	1-3-4-2		
Templar, A-445	Own	Simms	1-3-4-2		On top dead center
Tulsa, E-1-2-3	H-S, 7,000	Connecticut	1-3-4-2		1¾" on Flywheel Rim before T. D. C.
Velie, 58	Own	Atwater-Kent	1-5-3-6-2-4	.006"	
Velie, 48	Continental, 7R	Atwater-Kent	1-5-3-6-2-4		
Velie, 34	Falls	Atwater-Kent	1-4-2-6-3-5		
Westcott, A-44	Continental, 7R	Delco	1-5-3-6-2-4	.018"	¼" on Flywheel Rim after T. D. C.
Westcott, C-48	Continental, 9N	Delco	1-5-3-6-2-4	.018"	On top dead center
Wills St. Claire, A-68	Own	Delco	1R-4L-3R-2L-4R-1L-2R-3L		
Willys-Knight	Own	Auto Lite	1-2-4-3	.018"	1½" on Flywheel Rim after T. D. C.
Winton, 40	Own	Delco			

Electrical Equipment and Battery Data for 1922 Passengers

Motor Age Maintenance Data Sheet No. 186

MAKE AND MODEL	BATTERY				Type of System	Type of Wiring	Generator and Starter Make	GENERATOR AND STARTER				
	Make	Model	Capacity in Amp. Hrs.	Voltage				Model	Normal Charging Rate	Generator Cut Out Closes at	Starter Model	Starter Engagement
Ace, F	Exide		120	6-8	A	G. R.	Bosch		6 amp. at 25 M. P. H.	10 M. P. H.		Screw Shift
Ace, L	Exide				A	G. R.	Auto Lite		8 amp. at 25 M. P. H.	10 M. P. H.		Screw Shift
Ace, C	Exide				A	G. R.	Auto Lite		8 amp. at 30 M. P. H.	8 M. P. H.		Screw Shift
Ambassador, R	Exide	3XC-21-1	120	6-8	A	G. R.	Westinghouse		12 amp. at 7 M. P. H.	7 M. P. H.		Screw Shift
American, C	Willard	SJRN-3	96	6-8	B	G. R.	Gray & Davis	605				Screw Shift
Anderson, 40	Willard	SJ2N-4	111	6-8	A	G. R.	Remy	913D	10 amp. at 20 M. P. H.	10 M. P. H.	705-D	Screw Shift
Apperson, 8	Exide	3X6-15	104	6-8	A	G. R.	Bijur	M1378	15 amp. at 20 M. P. H.		1114	Screw Shift
Auburn, 6-51	Exide	3XC-15	90	6-8	A	G. R.	Remy	913F			705-A	Screw Shift
Bay State, 1	Exide		105	6-8	A	G. R.	Delco	165	10 amp. at 25 M. P. H.	8 M. P. H.	181	Screw Shift
Bell, 4-32	Presto Lite		90	6-8	A	G. R.	Westinghouse		15 amp. at 15 M. P. H.			Screw Shift
Bell, 6-50	Presto Lite		100	6-8	A	G. R.	Westinghouse		15 amp. at 20 M. P. H.			Screw Shift
Biddle, B1 & B5	Willard	SJR4		6-8	A	G. R.	Gray & Davis					Screw Shift
Brewster, O2	U. S. L.		80	12-16	B	G. R.	U. S. L.		12 amp. at 10 M. P. H.	10 M. P. H.		Magnetic Shift
Buick, Six	Exide	3XC-15-1		6-8	D	G. R.	Delco		15 amp. at 25 M. P. H.			Sliding Gear
Buick, Four	Exide	3XC-13-1		6-8	D	G. R.	Delco		15 amp. at 25 M. P. H.			Sliding Gear
Cadillac, 61	Exide		130	6-8	B	G. R.	Delco	98				Screw Shift
Case, X	Willard	SJRN-4	135	6-8	A	G. R.	Bijur	L22M1499	15 amp. at 20 M. P. H.	7 M. P. H.	ED160M1383	Screw Shift
Case, W	Willard	SJRG-4	135	6-8	A	G. R.	Delco	165	16 amp. at 15 M. P. H.	7 M. P. H.	208	Screw Shift
Chalmers, 35C	Presto Lite		106	6-8	C	G. R.	Auto Lite	GJ1058	12 amp. at 20 M. P. H.	10 M. P. H.		Screw Shift
Chandler, 1922	Presto Lite		105	6-8	A	G. R.	Bosch		12 amp. at 25 M. P. H.	8 M. P. H.		
Chevrolet, 490	Willard	SJRN	91	6-8	C	G. R.	Auto Lite		7 amp. at 15 M. P. H.	10 M. P. H.		Screw Shift
Chevrolet, FB				6-8		G. R.	Auto Lite					Screw Shift
Cleveland, 41	Presto Lite	611RHN	94	6-8	A	G. R.	Bosch	1000	14 amp. at 25 M. P. H.		4M-8C	Screw Shift
Cole, 870	Willard	SJRN-5	125	6-8	A	G. R.	Delco	131			72	Screw Shift
Columbia	Presto Lite	611RHN	80	6-8	A	G. R.	Auto Lite	GJ			MH-1025	Screw Shift
Columbia, Challenger	Presto Lite	RHN311			A	G. R.	Auto Lite	GJ	10 amp. at 15 M. P. H.		MG	Screw Shift
Columbia, L6	U. S. L.	CDX311X	80	6-8	A	G. R.	Auto Lite	GJ	10 . ampat 15 M. P. H.		MG	Screw Shift
Comet, C53-2	Willard			6-8	D	T. W.	Wagner					Screw Shift
Crawford				6-8	A	G. R.	Westinghouse		12 amp. at 36 M. P. H.			Screw Shift
Cunningham, V	Willard	SJRN-5	110	6-8	A	G. R.	Delco		14 amp. at 20 M. P. H.			Screw Shift
Daniels, D19	Willard		145	6-8	A	G. R.	Delco		14 amp. at 20 M. P. H.	8 M. P. H.	107	Sliding Gear
Davis, 71	Willard	SJR		6-8	C	G. R.	Delco	241				Screw Shift
Davis, 61-67	Willard	SJRN-3	94	6-8	A	G. R.	Delco	165			181	Screw Shift
Dixie Flyer, H	Willard	SJR-3	80	6-8	A	T. W.	Dyneto	CA	15 amp. at 25 M. P. H.	12 M. P. H.	DA	Screw Shift
Dodge Brothers	Willard	SJR	50	12-16	B	G. R.	North East		6½ amp. at 12 M. P. H.	9 M. P. H.		Chain Drive
Dorris, 6-80	Willard		138	6-8	A	G. R.	Westinghouse	760			751	Screw Drive
Dort, 19	U. S. L.	HDN311-X	90	6-8	A	G. R.	Bosch	636	12 amp. at 15 M. P. H.	9 M. P. H.	525	Screw Shift
Driggs, 1922	Presto Lite	611RHN	84	6-8	C	G. R.	Bosch		10 amp. at 20 M. P. H.	10 M. P. H.		Screw Shift

MAKE AND MODEL	BATTERY				Type of System	Type of Wiring	Generator and Starter Make	GENERATOR AND STARTER				
	Make	Model	Capacity in Amp. Hrs.	Voltage				Model	Normal Charging Rate	Generator Cut Out Closes at	Starter Model	Starter Engagement
Duesenberg	Exide		135	6-8	C	G. R.	Delco		15 amp. at 20 M. P. H.	8 M. P. H.		Screw Shift
Du Pont, A	Exide			12-16	A	T. W.	Westinghouse		10 amp. at 25 M. P. H.	8 M. P. H.		Screw Shift
Durant, A-22	U. S. L.	HDN-311		6-8	C	G. R.	Auto Lite	GH1036			MF1096	Screw Shift
Durant, B-22	U. S. L.	CDN313X	106	6-8	A	G. R.	Auto Lite		8 amp. at 20 M. P. H.			Screw Shift
Earl, 40	U. S. L.		95	6-8	C	G. R.	Auto Lite		13 amp. at 10 M. P. H.			Screw Shift
Elcar, K4	Willard	5040		6-8	A	G. R.	Delco	176	12 amp. at 12 M. P. H.			Screw Shift
Elcar, 7R	Willard	5040		6-8	A	G. R.	Delco	165	12 amp. at 12 M. P. H.			Screw Shift
Elgin Six, K-1	Willard	SJRN3	90	6-8	A	G. R.	Westinghouse	396238	11½ amp. at 25 M. P. H.	9 M. P. H.	396229	Screw Shift
Essex	Exide		80	6-8	A	G. R.	Bosch	1217			925	Sliding Gear
Ford, T	Own		80	6-8	A	G. R.	Own		10 amp. at 15 M. P. H.			Screw Shift
Franklin, 9-B	Willard	SXR-27	63	12-16	B	T. W.	North East		12 amp. at 18 M. P. H.			Chain
Gardner	Willard	SJRN-3	94	6-8	A	G. R.	Westinghouse		12 amp. at 10 M. P. H.	5 M. P. H.		Screw Shift
Goodspeed	Presto Lite		105	6-8		G. R.	Westinghouse					
Grant	Presto Lite	RHN-13	100	6-8	A	G. R.	Bijur	P-230M-1345	13 amp. at 25 M. P. H.		PO-140-M-138	Screw Shift
Gray	U. S. L.		80	6-8	A	G. R.	Westinghouse	34AT-1	10 amp. at 15 M. P.H.	8 M. P. H.	33-AB	Screw Shift
Halladay, 4	U. S. L.		84	6-8	A	G. R.	Westinghouse		8 amp. at 15 M. P H.			Screw Shift
Halladay, 6	U. S. L.		84	6-8	A	G. R.	Westinghouse		8 amp. at 15 M. P. H.			Screw Shift
Hatfield, A-42	Willard	SJRN4	100	6-8	A	G. R.	Dyneto	D	10 amp. at 15 M. P. H.		D	Screw Shift
Handley-Knight	U. S. L.			6-8	C	T. W.	Auto Lite					Screw Shift
Hanson Six, 60	Presto Lite	RHN-613	80	6-8	A	G. R.	Delco		10 amp. at 20 M. P. H.			Screw Shift
Haynes, 48	Willard	SJRN-5	132	6-8	A	G. R.	L-N	326	15 amp. at 18 M. P. H.	7 M. P. H.	318	Screw Shift
Haynes, 55	Willard	SJRN-5	132	6-8	C	G. R.	L-N	377	15 amp. at 18 M. P. H.	7 M. P. H.	388	Screw Shift
Haynes, 75	Willard	SJRN-5	132	6-8	C	G. R.	L-N	382	15 amp. at 18 M. P. H.	7 M. P. H.	380	Screw Shift
H. C. S., Series 3	Willard			6-8	A	G. R.	Delco					Screw Shift
Holmes, Series 4	Willard	SJR-27	70	12-16	B	G. R.	Dyneto	K & P	12½ amp. at 17 M. P. H.		K4R	Chain
Hudson, S-6	Exide	3X15-1	105	6-8	A	G. R.	Bosch	1217			926	Sliding Gear
Hupmobile, R	Willard	SJRN-4	117½	6-8	A	G. R.	Westinghouse	760	12 amp. at 19 M. P. H.		33 AB	Screw Shift
Jackson, 638	Exide		90	6-8	A	G. R.	Auto Lite		15 amp. at 20 M. P. H.	10 M. P. H.		Screw Shift
Jewett, Six	Willard	SJWN-4	115	6-8	A	G. R.	Remy	913E	11 amp. at 15 M. P. H.	5 M. P. H.	721A	Screw Shift
Jordan, MX	Willard	SJRN-4	108	6-8	A	G. R.	Delco	208	16 amp at 8 M. P. H.	0 M. P. H.	208	Screw Shift
King, K	Presto Lite	615RHN	120	6-8	A	G. R.	Westinghouse		12 amp. at 25 M. P. H.			Screw Shift
Kissel	Willard	SJRN-4	117½	6-8	A	G. R.	Remy	912-A	15 amp. at 20 M. P. H.		720D	Screw Shift
Kline, 6-55-K	Presto Lite	613RHN	100	6-8	A	G. R.	Wagner	EM305-45W	14 amp. at 15 M. P. H.	8 M. P. H.	EM320-36T	Screw Shift
LaFayette, 134	Exide	LXRV-15-2	150	6-8	B	G. R.	Delco		18 amp at 35 M. P. H.			
Lexington, ST	Willard		100	6-8	A	G. R.	Gray & Davis		14 amp. at 25 M. P. H.	7 M. P. H.		Screw Shift
Lexington, T	Willard		100	6-8	A	G. R.	Gray & Davis		14 amp. at 25 M. P. H.	7 M. P. H.		Screw Shift
Liberty, 10-D			105	6-8	A	T. W.	Wagner		15 amp. at 18 M. P. H.			Screw Shift
Lincoln	Exide	3LXRV15-2	135	6-8	B	G. R.	Delco		20 amp. at 15 M. P. H.			
Locomobile, 48	Exide	3XC21-1	120	6-8	A	T. W.	Westinghouse	760	7 amp. at 25 M. P. H.		775	Magnetic Shift
Maibohm, B	Willard	SJW-3	94	6-8	A	G. R.	Bijur	M137	14 amp. at 25 M. P. H.		M1308	Screw Shift
Marmon, 34	Willard	SRJ-6	162	6-8	A, C	G. R.	Delco		12 amp. at 25 M. P. H.	5 M. P. H.		Screw Shift
Maxwell	Presto Lite			6-8								Screw Shift
Mercer	Presto Lite	617SHC	149	6-8	A	G. R.	Westinghouse					Screw Shift
Merit	Willard	SJRN-4			A	G. R.	Delco	165	10 amp. at 25 M. P. H.		181	Screw Shift
McFarlan, TV	Willard	SJRN-5	135	6-8	C	G. R.	Westinghouse		15 amp. at 20 M. P. H.			Magnetic Shift
Mitchell, F-50	Willard	SJRN-4	113	6-8	A	G. R.	Remy	910A			700C	Screw Shift
Monroe	U. S. L.	CDN311X	84	6-8	A	G. R.	Auto Lite	GH1026		5 M. P. H.	MF1005	Screw Shift
Moon, 6-40	Exide	3XC13-1	85	6-8	C	G. R.	Delco		12 amp. at 25 M. P. H.	5 M. P. H.		Screw Shift
Moon, 6-48	Exide	3XL15-1	110	6-8	A	G. R.	Delco		12 amp. at 25 M. P. H.	5 M. P. H.		Screw Shift
Nash, 4	Willard	SJR-3	80	6-8	A	G. R.	Delco	229	14 amp. at 28 M. P. H.	6 M. P. H.	228	Screw Shift
Nash, 6	Willard			6-8	A	G. R.	Delco	Special	10 amp. at 25 M. P. H.		Special	Mechanical
National, BB	Presto Lite	615RNN2	125	6-8	A	G. R.	Westinghouse	760	10 amp. at 20 M. P. H.		751	Screw Shift
Noma, 1D	Willard		90	6-8	A	G. R.			10 amp. at 15 M. P. H.			Screw Shift
Noma, 3C	Willard		90	6-8	A	G. R.	Delco	165				Screw Shift
Norwalk, 4-30	Willard	SJWN	80	6-8	A	G. R.	Dyneto	CA	10 amp. at 25 M. P. H.		DA	Screw Shift
Oakland, 6-44	Presto Lite		80	6-8	A	G. R.	Remy		10 amp. at 20 M. P. H.			Screw Shift
Ogren, Six	Willard		90	6-8	A	G. R.	Bosch		10 amp. at 20 M. P. H.			Screw Shift
Oldsmobile 46	Willard	SJRN-4	80	6-8	C	G. R.	Delco	148	10 amp. at 15 M. P. H.	6 M. P. H.	178	Screw Shift
Oldsmobile, 43A	Willard	SJRN-4	80	6-8	C	G. R.	Auto Lite	GH102	10 amp. at 15 M. P. H.	6 M. P. H	1067	Screw Shift
Oldsmobile, 47	Willard	SJRN-4	80	6-8	A	G. R.	Delco	148	10 amp. at 15 M. P. H.	6 M. P. H.	219	Screw Shift
Overland, 4	U. S. L.		80	6-8	C	G. R.	Auto Lite		14 amp. at 25 M. P. H.	8 M. P. H.		Screw Shift
Packard, T6	Willard	SMR-7	120	6-8	A	G. R.	Bijur	M1426	16 amp. at 12 M. P. H.	6 M. P. H.	M104	Screw Shift
Packard, S6	Willard	SJRG-4	100	6-8	A	G. R.	AK-	5418	9 amp. at 10 M. P. H.	6 M. P. H	6324	Screw Shift
Paige, 6-66	Willard	SJRG4	118	6-8	A	G. R.	Remy	913-E	12 amp. at 13 M. P. H.		705-C	Screw Shift
Paige, 6-44	Willard	65WN4	118	6-8	A	G. R.	Remy	913-E	12 amp. at 15 M. P. H.		721-A	Screw Shift
Paterson, 22-6	Willard		80	6-8	A	G. R.	Delco		10 amp. at 15 M. P. H.			Magnetic Shift
Peerless, 56	Willard	2JRN5	125	6-8	A	G. R.	Auto Lite		15 amp. at 20 M. P. H.			Screw Shift
Pierce-Arrow, 33	Willard	SJRN6		6-8	A	G. R.	Delco			8 M. P. H.		Mech. Shift
Pilot, 6-50	Presto Lite	613RHN	120	6-8	A	G. R.	Bijur	M1480	12 amp. at 18 M. P. H.	9 M. P. H.	M1487	Screw Shift
Premier, 6-D	Willard	SJRN4	123.5	6-8	C	G. R.	Delco	195	16 amp. at 17 M. P. H.	5 M. P. H.	194	Screw Shift
Premocar	Exide				A	G. R.	Wagner					Screw Shift
R. & V. Knight, J	Willard	SJRN4	117.5	6-8	A	G. R.	Wagner	46	9 amp. at 20 M. P. H.		SE536	Screw Shift
R. & V. Knight, R	Willard	SJRN4	117.5	6-8	A	G. R.	Wagner	46	9 amp. at 20 M. P. H.		SE536	Screw Shift
Reo, T6	Willard		111	6-8	A	G. R.	North East					Chain
ReVere	Willard		120	6-8	A	G. R.	Westinghouse		18 amp. at 18 M. P. H.			Screw Shift
Rickenbacker	Presto Lite		106	6-8	A	G. R.	Simms	R			T	Screw Shift
Roamer, 6-54-E	Presto Lite		100	6-8	A	T. W.	Bijur		12 amp. at 25 M. P. H.			Screw Shift
Roamer, 4-75-E	Presto Lite		100	6-8	A	T. W.	Bijur		20 amp. at 25 M. P. H.			Screw Shift
Rolls Royce	Exide		90	12-16	A	T. W.	Bijur			11 M. P. H.		Magnetic Shift
Saxon, 125G	Presto Lite	613RHN	100	6-8	A	G. R.	Wagner	46V-5	18 amp. at 21 M. P. H.	7 M. P. H	36-T	Screw Shift
Sayers, Six	Willard	SJRN-3	93	6-8	A	G. R.	Delco	165	16 amp. at 20 M. P. H.		181	Screw Shift
Seneca, L2 & O2	Presto Lite	611RHN	95	6-8	A	G. R.	Auto Lite		15 amp. at 20 M. P. H.	7 M. P. H.		Screw Shift
Seneca, 50-51	Presto Lite	613RHN	94	6-8	A	G. R.	Auto Lite		10 amp. at 15 M. P. H.	7 M. P. H.		Screw Shift
Standard, 8	Willard		160	6-8	A	G. R.	Westinghouse		12 amp. at 15 M. P. H.			Screw Shift
Stanley, 735	Willard	SJRN-3		6-8	A	G. R.	Remy		12 amp. at 15 M. P. H.	10 M. P. H.		
Stanwood, A-22	Willard			6-8	A	G. R.	Westinghouse		10 amp. at 20 M. P. H.	12 M. P. H.		Screw Shift
Star												
Stearns-Knight, 4	Exide	6XC13-1	90	12-16	A	G. R.	Westinghouse		10 amp. at 25 M. P. H.	12 M. P. H.		Screw Shift
Stearns-Knight, 6												
Stephens, 90	U. S. L.	HDC313C	112	6-8	C	G. R.	Auto Lite	GJ1020	12 amp. at 20 M. P. H.	5 M. P. H.		Screw Shift
Stevens-Duyrea, E	Vesta		120	6-8	A	G. R.	Westinghouse					Magnetic Shift
Studebaker, B6				6-8	B	G. R.						Screw Shift
Studebaker, S6				6-8	B	G. R.						Screw Shift
Studebaker, L6				6-8	B	G. R.						Screw Shift
Stutz, K	Willard	5045	125	6-8	A	G. R.	Remy	EX264-1	16 amp. at 23 M. P. H.	7 M. P. H.	O-F	Screw Shift
Templar, 445	Presto Lite	613RHN	100	6-8	A	G. R.	Bijur	L220	12 amp. at 30 M. P. H.	8 M. P. H.	160M1390	Screw Shift
Tulsa	Exide	XC13	90	6-8	C	G. R.	Dyneto	GA	12 amp. at 25 M. P. H.			Screw Shift
Velie, 58	Willard	5JR3	120	6-8	A	G. R.	Bijur					Screw Shift
Velie, 48	Willard			6-8	A	G. R.	Bijur					Screw Shift
Velie, 34	Willard			6-8	A	G. R.	Westinghouse					Screw Shift
Washington, 6			100	6-8	A	G. R.	Bijur	1-220	12 amp. at 20 M. P. H.		ED-160	Screw Shift
Westcott, C-48	Willard	SJRN-4	117	6-8	A	G. R.	Delco	180	12 amp. at 30 M. P. H.	8 M. P. H.	179	Screw Shift
Westcott, A-44	Willard	SJRN-4	117	6-8	A	G. R.	Delco	165	14 amp. at 18 M. P. H.	7 M. P. H.	181	Screw Shift
Wills St. Claire	Willard	SJRG-4	140	6-8	B	G. R.	Delco		18 amp. at 25 M. P. H.			Screw Shift
Willys-Knight	U. S. L.		170	6-8	C	G. R.	Auto Lite		14 amp. at 25 M. P. H.	8 M. P. H.		Screw Shift
Winton, 40	Willard	SJRN5044	139	6-8	A	G. R.	Delco	243	14 amp. at 18 M. P. H	8 M. P. H	244	Screw Shift

A-K—Atwater Kent
G. R.—Grounded Return.
L-N—Leece Neville.
T. W.—Two Wire.

A—Generator, Starter and Ignition Separate.
B—Generator and Starter Combined.
C—Generator and Ignition Combined.
D—Generator, Ignition and Starter Combined.

The ACCESSORY SHOW CASE

New Sources of Retail Profit

RACE-WAY SPORT FENDERS FOR FORDS

The Race-Way Body Company of Indianapolis, Ind., is introducing a new sport crown fender for the Ford sedan and coupe models.

These fenders are manufactured from 16 gage sheet steel, being one piece, deep crown rolled, same as used on all higher class cars, and finished in rich black enamel. They are ironed with 12 inch frame extension in front, supporting a front splasher same as used on all higher priced cars. Price $49.50 per set.

BULL'S EYE SPARK PLUG

This spark plug is made of monel metal and bessemer screw steel. Shell and bushing are made of the latter, while the electrode is made of the former. It is the product of the Bull's Eye Spark Plug Mfg. Co., 200 Fifth avenue, New York, and sells for $1.25.

TEXTOIL SILENT TIMING GEARS

To overcome many of the difficulties encountered in the front end drives of engines, particularly as concerns the noisy operation of timing gears, a complete line of gears, known as the Textoil timing gears has been offered for national distribution by the John C. Hoof & Co., Chicago.

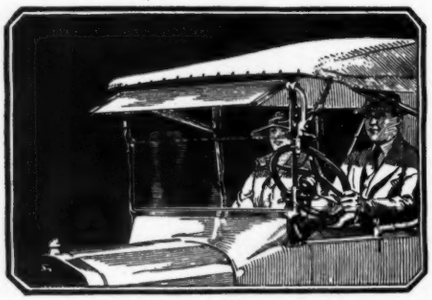
The material from which these gears are fabricated consists of a series of laminated 10-ounce cotton duck bound together with Bakelite. The majority of cars for which these gears are supplied have a train of three gears, consisting of one camshaft gear and two smaller gears. The usual procedure is to replace the camshaft gear with the non-metallic Textoil gear, an operation requiring as a rule from 2 to 5 hours.

MONOGRAM LENS

These lenses are designed to give a light 44 ft. wide with an intensity of over 80,000 candlepower on the roadway. The lens is perfectly smooth on the outside for washing. The inside center of the lens has a rectangular depression on which is molded the name of the car or the monogram of the owner can be put on with a decalcomania. Price $3 to $4. Monogram Lens Corp., 1835 Broadway, New York City.

SPEE-DEE HAND CLEANSER

The States Chemical Co., 694 W. Austin avenue, Chicago, is now producing Spee-Dee Hand Cleanser in tubes. The cleanser is recommended for removing grease and oils from mechanics' hands.



SUNBEAM JUNIOR VISOR FOR FORDS

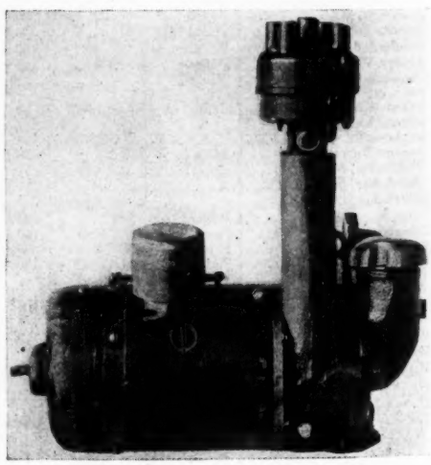
This is the Sunbeam Junior Visor for Fords, which sells at $8 and is manufactured by Thoma & Son, Inc., Fairfield, Ia., which firm also manufactures the Sunbeam Visor for larger cars at $16.

K-D DRUM TYPE HEADLAMP FOR FORDS

A drum shape headlamp for Fords, the body being drawn in one piece from suitable gage metal. All plate parts are brass and the bracket is a special forging, with a single bracket support for attaching to all Fords made since 1915. Adjustment can be made up or down or sideways. For all-nickel finish the price is $15 and dimmer bulbs $2 per pair extra. The diameter of the door is 9-in. Price $10 per pair in black and nickel. K-D Lamp Co., Cincinnati, O.

H. & H. GENERATOR-IGNITION UNIT FOR FORDS

Designed for connection to the Ford generator, this system is said to do away with loose and complicated wiring and requires no unnecessary mechanical drives or connections to the engine. It aids in the prevention of carbon, the getaway and pick-up of the engine and in hill climbing has a tendency to give greater power. H. & H. Generator-Ignition Co., 208 Middle street, Bridgeport, Conn.



COMING MOTOR EVENTS

AUTOMOBILE SHOWS

Montreal	Enclosed Car Salon	Sept. 30-Oct. 7
St. Paul	Automobile Dealers' Assn. at the Auditorium	Oct. 11-14
Detroit	Enclosed Car Salon at General Motors Bldg., Detroit Automobile Dealers' Assn.	Oct. 17-21
Wash'gton, City of	Enclosed Car Salon	Oct. 21-28
Chicago	Annual Show of the Automotive Equipment Association	Nov. 13-18
Cincinnati, O.	Second Annual Automobile and Radio Exposition	Nov. 23-29
New York	National Automobile Body Builders' Show	Jan. 8-13
New York	Annual Show	Jan. 6-13
Cleveland, O.	Annual Winter Show, Cleveland Automobile M'f'r's' and Dealers' Assn.	Jan. 20-27
Chicago	Annual Show at Coliseum N. A. C. C.	Jan. 27-Feb. 3
Minneapolis, Minn.	Annual Show	Feb. 3-10

CONVENTIONS

Santa Barbara	Annual Convention, California Automotive Trades Assn.	October
Chicago	Nat'l Association of Farm Equipment Manufacturers	Oct. 18-20
Chicago	Annual Meeting Automotive Equipment Association	Nov. 13-18

FOREIGN SHOWS

London	International Commercial Vehicle Exhibition	Oct. 12-13
Paris, France	Automobile Show	Oct. 4-15
London	Annual Show	Nov. 3-11

RACES

San Carlos, Calif.—500-Mile Armistice Day Race	Nov. 11
Los Angeles, Calif.	Nov. 30
San Diego, Calif.	January

SQUEEKS & RATTLES

If You Know Any, Tell Them to Us

Thou Shalt Not Knock the Other Fellow's Goods

This morning we drove down in our automobile and, As usual, we picked up someone going our way. This Someone was a rather unusual person, who, upon Entering our car, said, "I noticed that you have not Got shock absorbers on your bus and I wondered if I Could tell you about the kind I am selling." He Proceeded to tell us of "the kind he was selling." And, of course, they were the only ones which could Do the work. With them on a car, riding was like Taking a nap on a gondola in Venice and they were Guaranteed for five years. A few more words along The line he had been going and our car would have Had a set of those shock absorbers because this Fellow talked like a medicine man in a prairie Show, BUT he changed his line and told us about the Foolish people who had spent their money on another Brand of shock absorbers and got robbed because those Things weren't worth a dime. You know how you feel when You tell a knocker a lie? That's the way we felt when We told this guy that we had already contracted for a Set of those riyal shock absorbers to be installed on Our car. His face grew red a moment and then, he Started to talk about the weather and we were glad When he got out of our car. J. V. M.

A western truck dealer springs this one on unsuspecting customers in his letters: "Remember, we sell—trucks built in all capacities and wheelbases from three-quarters to six tons."

Squeeks & Rattles News Scoop

DECATUR, Ill., Sept. 25—A local inventor has startled the automotive world stiff with the announcement that he has completed a compressed air engine which threatens to make air as expensive as gas. One shot of the magic atmosphere starts a car off on a rampage that never stops and in addition to this, a tire rim which is as big a miracle as the Chicago White Sox is also announced. This rim makes it possible to change a tire while sitting in the front seat, playing solitaire.

A fellow drove his car out,
On a rainy day,
He had a drink and couldn't think
So now he's laid away.

Oh!

Starting your own electrical service station is usually considered a serious matter. This is possibly due to the gravity of the batteries used.

"WELL, YOU'LL NEED NEW BEARINGS, CYLINDERS, PLUGS, FAN, FENDERS, HOOD, TOP, AXLES AND IT'LL COST YOU 15 BUCKS--"
"NIX, THAT'S TOO MUCH DOUGH, I'LL GET ALONG WITHOUT THEM."

Trying to SATISFY Some People Is like Raising ELEPHANTS in Alaska

"Are you sure you have shown me all the principal parts of this car?" asked the fair prospective purchaser.

"Yes, madam, all the main ones," replied the dealer.

"Well, then, where is the depreciation? Tom told me that was one of the biggest things about a car."

IF A CAR IS ALWAYS DOWN, IT IS NEVER OUT

When she thinks she has a claim—are you defiant?
Do you keep in touch with the woman client?
Do you answer questions in a careful way,
So the customer will come another day?
Do you care a d—— after the car is sold
Whether she will come back, when the car is old?
Has she boosted all its merits with a shout,
Or is it always down when it should be out?

Some wise guy gets on his feet to remark that "the man who says just what he thinks, doesn't think very much." The answer to which is: those who DON'T say what they think, mustn't think at all or, it might be said that the man who says just he thinks, doesn't think very much of the person he says it to, eh, B. B. R.?

Oil Right

Stout Woman—"Put some oil in my car."
Service Station Clerk—"Sure, heavy?"
Stout Woman—"Say don't get fresh with me. I'll buy my oil elsewhere."
—Motor Topics.

Motorist (arrested for speeding)—"Good morning, judge, how are you?"
Judge—"Fine! $25."

Specifications of Current Motor Truck Models

NAME AND MODEL	Tons Capacity	Chassis Price	Bore and Stroke	TIRES Front	TIRES Rear	Final Drive
Acason	¾-1	$1650a	3¾x5	34x5n	34x5n	W
Acason...RB	1½	1950	3¾x5¼	36x3½	36x6	W
Acason...H	2½	2750	4⅜x5¼	36x4k	36x8k	W
Acason...L	3½	3150	4⅜x5¼	36x5k	36x10k	W
Acason...M	5	4350	5 x3¼	36x6	40x12	W
Ace...C	1½	2295	3¾x5⅛	34x3½k	34x5k	W
Ace...A	2½	2795	4¼x5½	36x4k	36x7	W
Acme...20	1	....	3¾x5	35x5n	35x5n	W
Acme...30	1½	....	3¾x5	34x3½	34x5	W
Acme...40	2	....	3¾x5	34x3½	34x5	W
Acme...60	3	....	4½x5¼	36x4	36x7	W
Acme...60L	3	....	4½x5½	36x4	36x7k	W
Acme...90	4½	....	4½x5½	36x5	40x10	W
Acme...125	6¼	....	4¾x6	36x6	40x12	W
American...25	2½	3350	4 x6	36x4k	36x4dk	W
American...40	4	4275	4½x6	36x5k	36x5dk	W
Armleder...20	1	....	3¾x5¼	34x3½k	34x6k	W
Armleder...21	1½	....	3¼x5¼	34x3½k	34x6k	W
Armleder...40-B	1½	....	4¼x5½	34x3½k	34x6k	W
Armleder...40-C	1½	....	4½x5¼	34x3½k	34x6k	W
Armleder..HW-B	2½	....	4¼x5½	36x4k	38x7k	W
Armleder..HW-C	2½	....	4½x5¼	36x4k	36x7k	W
Armleder..KW-B	3½	....	4½x6	36x5k	36x5dk	W
Armleder..KW-C	3½	....	4½x5¼	36x5k	36x5dk	W
Atlas...MD	1	1185	3½x5	32x4½n	32x4½n	W
Atlas...44	1½-2	....	3¾ 5⅛	36x6n	36x6n	W
Atterbury...20R	1½	2175	3¾x5	34x3½	34x5	W
Atterbury...22C	2½	3375	4½x5¼	36x4	36x4d	W
Atterbury...22C	2½	3375	4½x5¼	36x4	36x4d	W
Atterbury...22D	3½	4375	4½x5½	36x5	40x5d	W
Atterbury...22D	3½	4275	4½x5½	36x5	40x5d	W
Atterbury...8E	5	4975	4¾x6	36x5	40x6d	W
Atterbury...8E	5	5125	4¾x6	36x5	40x6	W
Autocar...21UF	1½-2	1950	4¾x4½t	34x4k	34x5k	D
Autocar...21UG	1½-2	2050	4¾x4½t	34x4k	34x5k	D
Autocar...27H	2	2950	4 x5½	34x5	36x7	D
Autocar...27K2	2	3075	4 x5½	34x5	36x7k	D
Autocar...26Y	5	3950	4¼x5½	34x6	36x12	D
Autocar...26-B	5	4100	4¼x5½	34x6	36x12	D
Available...H1½	1½	2175	4 x5	36x3½k	36x5k	W
Available...H2	2	2775	4 x5	36x3½k	36x6k	W
Available...H2½	2½	3160	4 x5	36x4k	36x8k	W
Available...H3½	3½	4175	4½x5½	36x5	40x5d	W
Available...H5	5	5375	5 x6	36x6	40x12	W
*Avery	1	....	3 x4s	34x5n	34x5n	I
Beck...A Jr.	1¼	1285a	3½x5	34x4½n	34x4½n	I
Beck...B-30	1½	1725	3¾x5	34x5	36x6	
Beck...C-40	2	1810	3¾x5	36x6	36x6	
Beck...D-50	2½	2395	4½x5¼	38x7	40x8	
Bell...M (Iowa)	1	1495	3⅝x5½	35x5	35x5n	W
Bell...E (Iowa)	1½	2100	3¾x5¼	34x3½	34x5	I
Bell...O (Iowa)	2½	2550	4½x5½	34x4	34x6	I
Bessemer...G	1	....	3½x5	35x5n	35x5n	I
Bessemer...H-2	1½	....	3¾x5	36x3½	36x5	I
Bessemer...J-2	2½	....	4⅛x5¼	36x4	36x4d	I
Bessemer...K-2	4	....	4½x5½	36x5	36x10	I
Bethlehem...KN	1	1195	3½x5	35x5n	35x5n	B
Bethlehem...CN	2	1595	4 x3¼	34x4½k	34x6k	I
Bethlehem...HN	3	2195	4 x5¼	36x4k	36x8k	I
*Bridgeport...A	1½	....	3⅜x5½	34x3½	34x6	W
Bridgeport...B	2½	....	4½x6½	36x4	36x4d	W
Bridgeport...C	3½	....	4½x6	36x5	36x10	W
Brinton...C	2	2500	3¾x5	34x4	34x5	W
Brinton...D	3	2975	4⅛x5¼	36x4	36x7	W
Brockway...E	1	....	3¾x5⅛	35x5n	35x5n	B
Brockway...S-S	1½	....	3¾x5	36x4	36x6	W
Brockway...SK	1½	....	4¼x5¼	36x4	36x6	W
Brockway...KR	2½	....	4½x5½	36x4	36x8	W
Brockway...K-S	2½	....	4½x5¼	36x4	36x8	W
Brockway...RT	3½	....	4¾x6	36x5	36x10	W
Brockway...R-4	3½	....	4½x5½	36x5	36x5d	W
Brockway...T-4	5	....	4¾x6	36x6	40x6d	W
*Buick	½	945b	3⅝x4¾	31x4n	31x4n	B
Case	2	....	4¼x5¾	36x6	38x7	I
*Chevrolet	¼	510b	3⅛x4	30x3½n	30x3½n	B
*Chevrolet...G	¾	650	3⅛x4	31x4n	34x4½n	B
*Chevrolet...T	1	1095	3⅛x5¼	33x4n	35x5n	W
Chicago...C1½	1½	....	4 x5	36x3½k	36x5k	W
Chicago...C2½	2½	....	4 x5	36x4k	36x7k	W
Chicago...C3½	3½	....	4½x5½	36x5	36x10	W
Chicago...D5	5	....	4½x5½	36x6	40x12	W
Clydesdale...10	¼-1½	1185	3¼x5	34x5n	34x5n	B
Clydesdale...18	¾-1½	1890	3¾x5	34x5	34x5	W
Clydesdale...20	1-1½	2385	3¾x5	34x5	34x5k	W
Clydesdale...42	1½-2	2475	3¾x5	36x3½	36x6	W
Clydesdale...65X	2½-3	3250	4¼x5¼	36x4	36x8	W
Clydesdale...65EX	2½-3	3150	4½x5½	36x4	36x8	W
Clydesdale...90	3½-4½	4100	4½x5½	36x5	36x10	W
Clydesdale...120	5-6	4500	4¾x6	36x6	40x12	W
Comet...T	1½	1950	3¾x5	34x4	34x4	W
Commerce...9	¾-1½	1150	3¾x5	32x4½n	32x4½n	B
Commerce...T	¾-1½	1450	3¾x5	34x4½n	34x4½n	B
Commerce...12	1½	1695	3¾x5	34x3½	34x4	I
Commerce...12	1½	1800	3¾x5	35x5n	35x5n	I
Commerce...16	2	1995	3¾x5	34x4	34x6	I
Commerce...16	2	2150	3¾x5	35x5n	36x6n	I
Commerce...18	2½	2150	4¼x5¼	36x4	36x7	I
Commerce...18	2½	2495	4¼x5¼	36x6n	40x8n	I
Commerce...25	2½	$2425	4⅛x5¼	36x4	36x7	W
Commerce...25	2½	2770	4⅛x5¼	36x6	40x8n	W
Cook...51	2½	3600	4 x5⅛	36x6n	40x8n	W
Corbitt...E-22	1	1480	3¾x5	34x3½	34x4	W
Corbitt...D-22	1½	2200	3¾x5	34x3½	34x5	W
Corbitt...C-22	2	2600	4⅛x5¼	36x3½	36x7	W
Corbitt...B-22	2½	3000	4⅛x5¼	36x4	36x7	W
Corbitt...R-22	3	3200	4½x5½	36x4	36x8	W
Corbitt...A-22	3½-4	3800	4½x5½	36x5	36x10	W
Corbitt...AA-22	5	4500	4¾x6	36x6	40x6d	W
Day-Elder...AS	1	1600	3¾x5	35x5n	35x5n	W
Day-Elder...B	1½	2000	3¾x5	34x3½	34x5	W
Day-Elder...D	2	2400	4⅛x5¼	36x4	36x7	W
Day-Elder...C	2½	2750	4¼x5½	36x4	36x7	W
Day-Elder...F	3½	3150	4½x5½	36x5	36x5d	W
Day-Elder...E	5	4250	4½x6	36x5k	40x6dk	W
Dearborn...E	1	1600	3⅝x5½	35x5n	35x5n	W
Dearborn...FX	1½	2300	3¾x5½	34x4	34x5	W
Dearborn...F	1½	2180	3¾x5½	34x4	34x5	W
Dearborn...48	2	2590	3¾x5½	34x4½n	34x7	W
Defiance...G	1	1695a	3¾x5	35x5n	35x5n	B
Defiance...D	1½	2095a	3¾x5	35x5n	36x6n	I
Defiance...E	2	2275a	3¾x5	35x5n	38x7n	I
Denby...31	1¼	1485	3½x5	35x5n	35x5n	B
Denby...33	1½	2145	3¾x5	35x5n	38x7n	I
Denby...34	2	2395	3¾x5	36x3½	36x6	I
Denby...35	2½-3	2795	4½x5¼	36x4	36x7	I
Denby...27	4	3895	4½x5½	36x5	36x5d	I
Denby...210	5	4295	4½x5½	36x6	40x6d	I
Dependable...A	¾-1	1650	3⅝x5½	34x5n	36x6n	W
Dependable...C	2	2350	3¾x5¼	34x3½	34x5	W
Dependable...D	2½	2650	4 x5½	34x5	36x6	W
Dependable...E	3	2950	4¼x5½	36x4	36x7	W
Diamond T...O-3	1-1¼	1975	3¾x5¼	36x3½n	36x4n	W
Diamond T...T	1½	2250	3¾x5¼	36x3½	36x5	W
Diamond T...U	2-2½	2650	4 x5¼	36x4	36x7	W
Diamond T...K	3½	3750	4¼x5½	36x5	36x5d	W
Diamond T...EL	5	4325	4½x5½	36x6	40x6d	W
Diamond T...S	5	4500	4¾x6	36x6	40x6d	W
Doane	2½	4100b	4¼x5¾	36x5	36x7	C
Doane	3½	5100b	4¾x5¾	36x5	36x5d	C
Doane	6	6000b	5 x6¼	36x6	40x6d	C
*Dodge Brothers	¾	730	3⅞x4½	32x4n	32x4n	B
Dorris...K-2	1	2490	4 x5½	33x5	33x5	B
Dorris...K-4	2-2½	3400	4¼x5½	36x4	36x7	W
Dorris...K-7	3½	4400	4¼x5½	36x5	36x10	W
*Dort	½-103	685a	3½x5	34x4n	34x4n	B
Double Drive...B	3	4000	4¼x5½	6	6	W
Duplex...A	2	2775	4 x5¼	35x5n	38x7n	W
Duplex...E	3½	3500	4½x5½	36x8	36x8	I
Duty...22	2	1590	3½x5	34x3½	34x5	I
Eagle...101	1½	1875	3⅝x5½	34x5	34x5	I
Eagle...100-2	2	2275	3¾x5¼	34x4k	34x7k	I
F. W. D...B	3	4200	4⅜x5½	36x6	36x6	B
Fageol...1½	1½	3000	3¾x5¼	34x3½k	34x6k	W
Fageol...2½	2½	3900	4¼x5¾	34x4	36x7	W
Fageol...3½	3½	5000	4½x6¼	36x5k	40x5dk	W
Fageol...5	5	5700	4½x5¾	36x6	40x6d	W
Fargo...R	2	1700	3¾x5	36x4	36x6	I
*Federal	1½	1375	3¾x5	—x5n	—x5n	
Federal...SD	1½	1800	3¾x5	35x5n	36x6n	W
Federal...TE	1½	2175	4⅛x5¼	36x3½	36x5	W
Federal...UE	2-2½	2425	4⅛x5¼	36x4	36x7	W
Federal...WE	3½-4	3150	4½x5½	36x5	36x5d	W
Federal...X2	5-6	4500	4¾x6	36x6	40x6d	W
*Ford...TT	1	430	3¾x4	30x3½n	32x4½n	W
Front Drive...C	1½	2800	3¾x5½	5	4	W
G & J**...20	1	2275	3⅝x5⅛	34x5n	34x5n	W
G & J**...A	2-2½	3375	4 x5¼	36x4	36x7	W
G & J**...B	3½-4	4475	4½x5½	36x5	36x10	W
G.M.C...K16	1	1295	3½x5½	34x5n	34x5n	B
G.M.C...K-41A	2	2375	4 x5½	36x4k	36x7k	W
G.M.C...K-41B	2	2375	4 x5½	36x4k	36x7k	W
G.M.C...K-41T	5†	2450	4 x5½	36x4	36x8	W
G.M.C...K-71A	3½	3600	4½x6	36x5	40x5d	W
G.M.C...K-71B	3½	3700	4½x6	36x5	40x5d	W
G.M.C...K-71T	10†	3700	4½x6	36x5	40x12	W
G.M.C...K-101A	5	3950	4½x6	36x5	40x6d	W
G.M.C...K-101T	15†	4050	4½x6	36x5	40x14	W
G.M.C...K-101B	5	4050	4½x6	36x5	40x6d	W
G.W.W	1½	1850	3¾x5½	35x5	35x5	I
*Garford	1	1590	3⅝x5⅛	34x5n	34x5n	W
Garford...25-B	1½	1990	3¾x5⅛	36x3½	36x5	W
Garford...70-H	2½	2750	4¼x5½	36x4	36x8	W
Garford...77-D	4	3750	4½x6	36x5	36x5d	W
Garford...68-D	5	$4500	5 x6½	36x6	40x6d	W
Garford...150-A	7½	5200	5 x6½	36x6	40x7d	C
Gary...F	1-1½	1775	3¾x5	36x3½	36x5	W
Gary...1	2	2450	4 x5½	36x3½	36x6	W
Gary...J	2½	2850	4¼x5½	36x4	36x8	W
Gary...K	3½	3790	4½x6	36x5	40x5d	W
Gary...M	5	4450	5 x6½	36x6	40x6d	W
Gersix...M	1½	3100	4 x5½	36x3½	36x7	W
Gersix...K	2½	3500	4½x5½	36x4	36x8	W
Gersix	3½	4500	4½x6	36x5	40x12	W
Graham Bros.	1	1265	3⅞x4½	33x4½n	34x5n	B
Graham Bros.	1¾	1325	3⅞x4½	33x4½n	36x6n	B
1Gramm-Pion...10	1	1245	3½x5	33x5n	33x5n	B
1Gramm-Pion...15	1½	1750a	3¾x5	36x3½k	36x5k	I
1Gramm-Pion...65	1½	2250a	3¾x5	36x3½k	36x5	W
1Gramm-Pion...20	2	2475a	4⅛x5¼	36x4k	36x7k	W
1Gramm-Pion...30	3	3300a	4¼x5½	36x4k	36x4dk	W
1Gramm-Pion.75P	3½	4225a	4½x5½	36x6n	42x9n	W
1Gramm-Pion...40	4	3850a	4½x5½	36x5	36x5dk	W
1Gramm-Pion...50	5-6	4450a	4¾x6	36x6	40x6dk	W
Hall...1½	1½	3100	3¾x5	34x5n	38x7n	W
Hall...2½	2½	3275	4¼x5¼	36x4	36x6	W
Hall...3½	3½	4100	4½x5½	36x5	36x5d	W
Hall...5	5	5100	4½x5½	36x5	40x6d	W
Hall...7 chain	7	5100	4½x5½	36x5	40x6d	C
Harvey...W OA	2	2650	4¼x5½	34x4	34x7	W
Harvey...WFA	2½	2950	4¼x5½	36x4	36x7	W
Harvey...WHA	3½	3950	4½x6	36x5	36x5d	W
Hawkeye...O	1	1375	3⅝x5½	34x5n	34x5n	
Hawkeye...K	1½	1645	3¾x5½	34x3½k	34x5k	I
Hawkeye...M	2	2145	4¼x5	36x4k	36x6k	I
Hawkeye...N	3½	3700	4½x6¾	36x5k	36x10k	I
Hendrickson...O	1½	2200	3⅝x5½	36x4n	36x5n	W
Hendrickson...N	2½	2690	4¼x5¾	36x4k	36x7k	W
Hendrickson...M	3½	3000	4¼x5	36x5k	36x5dk	W
Hendrickson...K	5	4000	5 x6¼	36x6	40x6	W
Huffman...B	1½-2	1795	3¾x5	34x3½	34x6	W
Huffman...C	1½-2	1695	3¾x5½	36x3½	36x6	I
Huffman...D	2-3	2895	4½x5½	36x4	36x7	
Hurlburt...A-A	1-1½	1950	3¾x5	34x5n	34x5n	W
Hurlburt...B-B	2-2½	2800	4¼x5½	36x4	36x4d	W
Hurlburt...C-C	3-3½	3475	4¼x5½	36x5	36x5d	W
Hurlburt...D-D	4-4½	4150	4½x6	36x5	36x6d	W
Hurlburt...E-E	6-6½	4850	4¾x6½	36x6	40x6d	W
Indep'd't(Iowa) B	1	1665	3½x5	34x3½	34x4	I
Indep'd't(Iowa) G	1½	2040	3¾x5¼	34x3½	34x5	I
Indep'd't(Ia.)..HI	2½	2940	4½x5¼	36x4	36x7	I
Indiana...12	1½-2	....	3¾x5¼	34x3½k	34x5k	W
Indiana...20	2	....	4½x5½	36x4k	36x7k	W
Indiana...25	2½-3	....	4½x5½	36x4k	36x8k	W
Indiana...35	3½-4	....	4⅜x5½	36x5k	36x5dk	W
Indiana...51	5-7	....	5 x6¼	36x5k	40x6dk	W
*International...S	1	1250	3½x5	34x5n	34x5n	I
International...21	1	1550	3½x5¼	36x3½	36x3½	I
International...31	1½	1650	3½x5¼	36x3½	36x4	I
International...41	2	2100	3½x5¼	36x3½	36x5	I
International...101	5	3600	4¼x5	36x5	40x10	I
Jackson...4W D	3½	3850	4½x5½	36x7	36x7	B
K-Z...1	1	1750	3½x5	34x3½	34x5	W
K-Z...1½	1½	2075	3¾x5	36x4	36x6	W
K-Z...2½	2½	2550	4½x5¼	36x4	36x8	W
K-Z...3½	3½	3350	4½x5½	36x5	40x10	W
K-Z...5	5	3850	4½x5½	36x6	40x6d	W
Kalamazoo...T	1	1295	4 x5	34x5	34x5n	B
Kalamazoo...G-1	1½	1800	3¾x5	34x4	34x5	W
Kalamazoo...LG	2	2645	4 x5	36x4	36x7	W
Kalamazoo...NH	3	3145	4 x6	36x5	36x10	W
Kalamazoo...HD	3	3350	4¼x6	36x5	36x10	W
Kalamazoo...SK	4	3845	4¼x6	36x5	36x12	W
Kalamazoo...OK	5	4350	4½x6	36x6	40x6d	W
2Kelly-S...K-31	1½	2700	3¾x5¼	36x3½	36x6	C
2Kelly-S...K-34	1½	2700	3¾x5¼	36x3½	36x6	W
2Kelly-S...K-38	2½	2900	3¾x5¼	36x4	36x4d	W
2Kelly-S...K-35	2½	2900	3¾x5¼	36x4	36x4d	C
2Kelly-S...K-40	3½	3900	4½x6½	36x5	40x5d	C
2Kelly-S...K-41	3½	3900	4½x6½	36x5	36x10	I
2Kelly-S...K-42	3½	3900	4½x6½	36x5	40x5d	W
2Kelly-S...K-50	5	4400	4½x6½	36x6	40x6d	C
2Kelly-S...K-60	6	4600	4½x6½	36x6	40x7d	C
2Kelly-S...K-61	5-7	4800	4½x6½	36x6	36x7d	I
Kimball...AB	2	3675	4 x6	36x4	36x7	W
Kimball...AC	2½	3975	4¼x6	36x4	36x8	W
Kimball...AK	3	4500	4½x6	36x4	36x10	W
Kimball...AE	4	5000	4¾x6	36x5	40x12	W
Kimball...AF	5	5500	5 x6	36x6	40x7d	W
*Kissel...Express	1	1585	3⅞x5½	34x5n	34x5n	W
Kissel...Utility	1½	1975	3⅞x5½	36x3½	36x6	W
Kissel...Freighter	2½	2875	4¼x5½	36x4	36x8	W
Kissel...H. D.	4	3675	4¼x5½	36x5	36x12	W
Kleiber...AA	1	2200	4¼x5¼	34x3½k	34x5k	W
Kleiber...A	1½	3100	4½x5¼	36x3½k	36x6k	W

FINAL DRIVE:—B—Bevel, C—Chain, D—Double Reduction, I—Internal Gear, W—Worm. r—8 cyl. s—6 cyl. t—2 cyl.—all others are 4 cyl. d—dual tires. k—pneumatic tires optional at extra cost. n—pneumatic tires. a—price includes several items of equipment. b—price includes body. *—express truck or delivery wagon. **—Canadian Make. trac.—tractor. †Capacity with semi-trailer.

1—Gramm-Pioneer. 2—Kelly-Springfield.

Specifications of Current Motor Truck Models—Continued

NAME AND MODEL	Tons Capacity	Chassis Price	Bore and Stroke	TIRES Front	TIRES Rear	Final Drive
Kleiber.....BB	2	$3600	4½x5¼	36x4k	36x7k	W
Kleiber.....B	2½	3950	4½x5½	36x5k	36x8	W
Kleiber.....C	3½	4600	4½x5½	36x5	36x5d	W
Kleiber.....D	5	5300	5 x6½	36x6	40x12	W
Koehler.....D	1½	2150	3½x5	34x3½	34x5	W
Koehler.....M	2½	3175	4 x5⅛	36x4	36x7	W
Koehler.....MCS	2½	3275	4 x5⅛	36x4	36x7	W
Koehler.....F	3½	4470	4½x5½	36x5	36x10	W
Koehler,MT. Trac	5	3275	4 x5⅛	36x4	36x7	W
Krebs.....	¾	1260	3¾x5	34x4½	34x4½	B
Krebs.....	1	1565	3¾x5	34x5	34x5	W
Krebs.....	1½	2125	4½x5¼	36x4	36x7	W
Krebs.....	2½	2375	4½x5½	36x4	36x8	W
Krebs.....	3½	2975	4½x5½	36x5	40x10	W
Larrabee.....X-2	1	1925	3¼x4½	34x5n	34x5n	B
Larrabee.....U	1½	2400	3¾x5	34x3½	34x5	W
Larrabee.....J	1½-2	2400	3¾x5	34x3½k	34x5k	W
Larrabee.....K	2½-3	3100	4½x5¼	36x4	36x7	W
Larrabee.....K-5	2½-3½	3450	4½x5½	36x4	36x8	W
Larrabee.....L-4	3½-5	4000	4½x5¼	36x5	36x5d	W
Larrabee.....W	5-7	4800	4¼x6	36x6	40x6d	W
Maccar.....L	1½	....	4½x5½	36x4	36x6	W
Maccar.....H-A	2	....	4½x5¼	36x4	36x4d	W
Maccar.....H-2	3	....	4½x5½	36x4	36x5d	W
Maccar.....M-3	4	....	4½x5½	36x5	36x6d	W
Maccar.....G	5 6	....	4¾x6	36x5	40x6d	W
MacDonald.....A	7½	5750	4½x6	40x7	40x14	I
Mack...AB D.R.	1½	3150	4 x5	36x4	36x3½d	D
Mack...AB Chain	1½	3000	4 x5	36x4	36x3½d	C
Mack...AB Chain	2	3300	4 x5	36x4	36x4d	C
Mack...AB D.R.	2	3750	4 x5	36x4	36x4d	D
Mack...AB D.R.	2½	3850	4 x5	36x4	36x4d	D
Mack...AB Chain	2½	3400	4 x5	36x4	36x4d	C
Mack...AC Chain	3½	4950	5 x6	36x5	40x5d	C
Mack...AC Chain	5	5500	5 x6	36x6	40x6d	C
Mack...AC Chain	6½	5750	5 x6	36x6	40x12	C
Mack...AC Chain	7½	6000	5 x6	36x7	40x7d	C
Mack Trac...AB	5	3400	4 x5	36x4	36x4d	C
Mack Trac...AC	7	4950	5 x6	36x5	40x5d	C
Mack Trac...AC	10	5500	5 x6	36x6	40x6d	C
Mack Trac...AC	13	5750	5 x6	36x6	40x12	C
Mack Trac...AC	15	6000	5 x6	36x7	40x7d	C
*Mapleleaf.....**	1½	3000	3¾x5½	34x5n	36x6n	W
Mapleleaf...AA**	2	3600	4 x5½	36x4	36x7	W
Mapleleaf...BB**	3	4050	4½x5½	36x4	36x4d	W
Mapleleaf...CC**	4	4800	4½x5½	36x5	36x5d	W
Mapleleaf...DD**	5	5625	4½x5½	36x6	40x6d	W
Master.....JW	1½	2290	4½x5½	34x3½	34x5	D
Master.....JD	1½	2590	4½x5½	34x3½	34x5	D
Master.....Z	2	2290	4½x5½	34x3½	34x5	W
Master.....W	2½	2890	4½x5½	34x4	36x7	W
Master.....DD	2½	3190	4½x5½	34x4	36x7	D
Master.....A	3½	3990	4½x6	36x5	40x5d	W
Master.....E	3½	4290	4½x6	36x5	40x5d	D
Master.....Y	4	4490	4½x6	36x5	40x6d	D
Master.....B	5	4990	4¾x6½	36x6	40x6d	W
Master.....F	5	5090	4¾x6	36x6	40x6d	D
MasterTrac.,DDT	6	3390	4½x5½	34x4	36x7	D
*Maxwell.....1½	1½	932	3⅝x4½	32x3n	32x4n	W
*Menominee.....	1	1650	4 x5	34x5n	34x5n	W
Menominee...HT	1-1¼	2000	3¾x5	31x3½	30x5	W
Menominee....H	1½	2475	4 x5	36x3½	36x5	W
Menominee....D	2-2½	2875	4 x6	36x4	36x8	W
Menominee....G	3½	3800	4½x6	36x5	36x10	W
Menominee...J-3	5	4250	4¾x6	36x6	40x12	W
Moline.....10	1½	1985	3½x5	31x5n	36x6n	I
*Moreland...R. R.	1	1595	4 x5	34x5n	34x5n	B
Moreland.....BX	1½	1980	4 x5	36x3½	36x6k	W
Moreland.....EX	2	2800	4½x5¼	36x4	36x7k	W
Moreland.....AX	3	3500	4½x5½	36x5	36x10k	W
Moreland.....RX	4½-5	4600	4¼x6	36x6	40x6	W
Nash.....2018	1-1½	1595	3¾x5¼	34x3k	34x4k	I
Nash.....3018	2-2½	2150	3¾x5¼	34x4k	34x7k	I
Nash.....Quad	2-2½	2750	4¼x5½	36x5k	36x5k	I
Nash..3018, LWB	2-2½	2200	3¾x5¼	34x4k	34x7k	I
Nash. Quad. LWB	2-2½	2800	4¼x5½	36x5k	36x5k	I
Nash.....5018	2½	2250	3¾x5¼	34x4k	34x7k	I
'Nelson.....G2	1½	....	4½x5¼	36x3½	36x6	W
'Nelson.....G3	2½	....	4½x5¼	36x4	36x7	W
'Nelson.....G4	3½	....	4½x5½	36x5	36x5d	W
'Nelson.....GS	5	....	4¾x6	36x6	40x6d	W
Neteo.....DK	2	3100	4½x5¼	36x4k	36x7k	W
Neteo.....HL	2½	3500	4½x5½	36x4k	36x8k	W
Niles.....E	2	3000	4½x5½	36x4k	36x7k	W
Noble.....A21	1¼	1840	3½x5½	34x5	34x5	W
Noble.....B31	1½-2	2480	3¾x5¼	36x4	36x7	W
Noble.....D51	2½-3	2950	4¼x5½	36x4	36x8	W
Noble.....E71	3½-5	3800	4½x6	36x5	36x10	W
Noble.....B30	1½	....	3¾x5¼	36x3½	36x5	W
Noble.....C40	2	....	4 x5½	36x4	36x7	W
Noble.....D50	2½	....	4¼x5½	36x4	36x8	W
Noble.....E70	3½	....	4½x6	36x5	36x10	W
Northwestern..W	1½	2700	4½x5¼	34x4	36x6	W
Northwestern.WS	2½	3500	4½x5½	36x4	36x8	W
Norwalk.....25E	1	1595	3½x5	34x3½	34x4	W
Norwalk.....35E	1½	1925	3½x5	34x3½	34x3½d	W
Norwalk,35E.Spec	1½	2285	3¾x5¼	34x3½	34x5	W
Ogden.....A2	1	....	3½x5	34x5n	34x5n	W
Ogden.....D	1½	....	3¾x5	36x3½	36x5	W
Ogden.....E	2½	....	4¼x5¼	36x4	36x8	W

NAME AND MODEL	Tons Capacity	Chassis Price	Bore and Stroke	TIRES Front	TIRES Rear	Final Drive
Old Hickory...W	1	$1775	3¾x5	36x3½k	36x4k	W
Old Reliable....A	1½	2350	4 x5	34x4	36x6	W
Old Reliable....B	2½	3500	4¼x6	34x4	36x4d	W
Old Reliable....C	3½	4250	4½x6	36x5	36x5d	W
Old Reliable....D	5	5000	4¾x6	36x6	40x6d	W
Old ReliableKLM	7	6000	4¾x6¼	36x6	40x7d	C
*Oldsmobile Econ	1	1005	3½x5¼	35x5n	35x5n	I
Olympic.....A	2½	3200	4½x5½	36x4	36x8	W
Oneida.....B9	1½	2825	4 x5¼	36x3½	36x7	
Oneida.....C9	2½	3200	4 x5¼	36x4	36x8	
Oneida.....D9	3½	4050	4½x5½	36x5	36x10	
Oneida.....E9	5	4725	4½x5½	36x6	40x12	
Oshkosh.....A	2	3250	3½x5	36x6n	36x6n	B
Oshkosh.....AA	2	3400	3½x5	36x6n	36x6n	B
Oshkosh.....B	2½	3850	4 x5⅛	38x7n	38x7n	B
Oshkosh.....BB	2½	4000	4 x5⅛	38x7n	38x7n	B
*Overland.....4	1½	450	3⅜x4	30x3½n	30x3½n	B
Packard.....EC	2-3*	3100	4¼x5½	36x4	36x7	W
Packard.....EX	2-2½	3100	4¼x5½	36x6n	40x8n	W
Packard.....ED	3½-4½	4100	4½x5½	36x5	36x5d	W
Packard.....EF	5-7½	4500	5 x5½	36x6	40x6d	W
Paige.....52-19	1½	1950	4 x5¼	34x3½	34x5	W
Paige.....54-20	2½	2420	4¼x5½	34x4	34x8	W
Paige.....51-19	3½	3145	4½x5½	36x5	36x5d	W
Parker.....C-22	1	1875	3¾x5¼	34x5n	34x5n	W
Parker.....G-22	2½	3200	4¼x6	34x4	36x4d	W
Parker.....J-20	3½	3950	4½x6	36x5	40x5d	W
Parker.....M-20	5	4850	5 x6	36x6	40x6d	W
Patriot...Revere	1	1380	3¾x5	35x5n	35x5n	W
Patriot...Lincoln	2	2050	4 x5¼	34x3½	34x5	W
Patriot .Washgt'n	3	2900	4½x5½	36x4	36x7	W
Pierce-Arrow.....	2	3200	4 x5½	36x4	36x4d	W
Pierce-Arrow.....	3½	4350	4½x6¾	36x5	36x5d	W
Pierce-Arrow.....	5	4850	4½x6¾	36x5	40x6d	W
Pittsburgher.....	1½-2	3000	3⅝x5	36x4	36x6	..
Pittsburgher.....	3	3800	4½x5¼	36x5k	36x8	W
Power.....F	2	3150	4 x5¼	36x5	36x7	W
Power.....C	3½	....	4½x5½	36x5	40x10	W
Promocar...B-143	1½	2475	3½x5	36x6n	36x6n	W
*Rainier.....R-21	¾	....	3½x5	35x5n	35x5n	W
Rainier.....R-29	1	....	3¾x5	34x3½	34x4	W
Rainier.....R-26	1½	....	3¾x5	34x3½	31x5	W
Rainier.....R-28	2	....	4¼x5½	34x4	34x6	W
Rainier.....R-20	2½-3	....	4½x5¼	34x4	34x7	W
Rainier.....R-15	3½-5	....	4½x5½	36x5	36x5d	W
Rainier.....R-17	5-6	....	4¾x6	36x6	40x6d	W
Ranger..TK-20-2	1½	2450	3¾x5	36x6n	38x7n	W
*Reo.....F	¾-1½	1245	4½x5½	31x4½n	34x4½n	B
Reliance.....10A	1½	2400	4 x5¼	36x3½	36x5	I
Reliance.....20B	2½	3100	4¼x5½	36x4	36x4d	I
Republic.....75	¾	1395b	3½x5	32x4½n	32x4½n	I
Republic.....10	1	1395	3¾x5	34x3	31x4	I
Republic..10 Exp	1	1695	3¾x5	34x5n	34x5n	I
Republic.....11X	1½	1795	3¾x5	31x4	34x6	I
Republic.....19	2½	2195	4½x5¼	36x4	36x7	I
Republic.....20	3½	3095	4½x5½	36x5	36x10	I
Rowe.....CW	1½	3000	3¾x5	36x6n	36x6n	W
Rowe....C.D.W.	2	3300	4 x5	34x4	36x3½d	W
Rowe....G.S.W.	3	4150	4 x6	34x5	36x5d	W
Rowe....G.P.W.	3	5250	3½x5r	38x7n	42x9n	W
Rowe.....HW	4	4500	4¼x6	36x5	36x6d	W
Rowe.....F. W.	5	5500	4½x6	36x6	40x6d	W
Ruggles.....20	1	1195	3¾x5	34x5n	34x5n	B
Ruggles.....40	2	1795	4 x5	34x5n	34x7	D
Samson.....15	¾	....	4-3¼x4	32x4n	32x4n	B
Samson.....25	1¼	....	4-3¼x5½	35x5n	35x5n	B
Sanford.....W-15	1½-2	2150b	3¾x5	36x3½k	36x5k	
Sanford.....25	2½-3½	....	4½x5¼	36x4	36x4d	W
Sanford.....35	3½-5	....	4½x5½	36x5	36x5d	W
Sanford.....50	5-7	....	4¾x6	36x5	40x6d	W
Schacht....2-Ton	2	3200	4¼x5½	36x4	36x7	W
Schacht....3-Ton	3	3800	4½x5½	36x5	36x5d	W
Schacht....4-Ton	4	4200	4½x6	36x5	40x5d	W
Schacht....5-Ton	5	4400	4½x6	36x5	40x6d	W
Schacht....7-Ton	7	5050	4½x6	36x6	40x7d	W
Schwartz.....A	1	1685	3½x5	34x4½n	34x4½n	B
Schwartz.....K	2	3000	3¾x5¼	34x3½	34x7	W
Schwartz.....L	3	3600	4¼x5½	36x4	36x8	W
Schwartz.....M	5	4900	4½x6	36x6	40x12	W
Selden.....30	1½-2½	2250	3¾x5	34x3½	34x5	W
Selden.....31	1½-2½	3350	4½x5¼	34x5a	38x7n	W
Selden.....50	2½-3½	3250	4½x5¼	36x4	36x7	W
Selden.....51	2½-3½	4350	4½x5½	36x6n	40x8n	W
Selden.....70	3½-5	3750	4½x5½	36x5	36x10	W
Selden.....90	5-7	4950	4¾x6	36x6	40x12	W
Seneca.....M	1½	820	3½x4½	30x3½n	30x3½n	B
*Service.....12	¾	....	3½x4½	32x4½n	32x4½n	B
*Service.....15	1¼	....	3⅝x5	34x4½n	35x5n	B

FINAL DRIVE:—B—Bevel, C—Chain, D—Double Reduction, I—Internal Gear, W—Worm. r—8 cyl. s—6 cyl. t—2 cyl.—all others are 4 cyl. d—dual tires. k—pneumatic tires optional at extra cost. n—pneumatic tires. a—price includes several items of equipment. b—price includes body. *—express, truck or delivery wagon. **—Canadian Make. trac.—tractor.

NAME AND MODEL	Tons Capacity	Chassis Price	Bore and Stroke	TIRES Front	TIRES Rear	Final Drive
Service.....21	1½	....	3½x5½	34x3½	34x5	W
Service.....32	2	....	4 x5½	36x3½	36x7	W
Service.....37	2	....	4¼x5½	35x5n	38x7n	W
Service.....52	3	....	4¼x5½	36x4	36x8	W
Service.....72	3½	....	4¼x5½	36x5	36x5d	W
Service.....77	4	....	4½x6	36x5	36x5d	W
Service.....102	6	....	4½x6	36x6	40x6d	W
Signal.....NF	1	$1450	3¾x5	34x5n	36x6n	W
Signal.....H	1½	1950	4½x5¼	34x4	36x6	W
Signal.....J	2½	2375	4½x5¼	34x4	36x8	W
Signal.....M	3½	3175	4½x5½	36x5	40x5d	W
Signal.....R	5	3900	4¾x6	36x6	40x6d	W
*Standard.....75	1¼	1330	3¾x5	33x5n	33x5n	W
Standard.....1-K	1½	1600	3¾x5	34x3½k	34x5k	W
Standard.....76	2½-3	2400	4½x5¼	36x4k	36x7k	W
Standard.....66	3½-5	3150	4½x5½	36x5	36x10	W
Standard.....5-K	5-7	4400	4¾x6	36x6	40x12	W
*Star.....	½	610b	3½x4¼	30x3½n	30x3½n	B
Sterling.....1½	1½	2385	4 x5¼	36x3½k	36x5k	W
Sterling.....2	2	3085	4 x5¾	36x4k	36x6k	W
Sterling.....2½	2½	3290	4½x5¾	36x4k	36x4dk	W
Sterling.....3½	3½	4325	4½x6¼	36x5k	40x5dk	W
Sterling.....5-W	5	4950	5 x6¼	36x6	40x6d	W
Sterling.....5-C	5	5500	5 x6¼	36x6	40x6d	C
Sterling.....7½	7½	6000	5 x6¼	36x6	40x7d	C
*Stewart...Utility	¼-1½	1245	3⅝x5½	34x4½n	34x4½n	I
Stewart.....15	1½-1¾	1445	3⅝x5⅛	35x5n	35x5n	I
Stewart.....9	1½-2	1790	3¾x5	34x3½	34x5	I
Stewart.....7	2-2½	2190	4½x5¼	34x4	34x7	I
Stewart.....7-X	2½-3	2390	4½x5½	34x4	34x7	I
Stewart.....10	3½-4	3190	4½x5½	36x5	36x5d	I
Stewart.....10-X	3½-4	3190	4½x6	36x5	36x5d	I
*Stewart.....	1¼	1245	4-3⅛x5½	34x4½n	34x4½n	
*Stoughton.....C	¾	1240	3½x5	34x4½n	34x4½n	B
Stoughton.....A	1	1790	3¾x5¼	34x5n	34x5n	w
Stoughton.....B	1½	2150	3¾x5¼	36x3½	36x5	w
Stoughton.....D	2	2490	4 x5½	36x4	36x7	w
Stoughton.....F	3	3150	4½x5½	36x5d	36x5d	W
Sullivan.....E	2	2800	4¼x5½	36x4k	36x7k	W
Sullivan.....H	3½	3750	4½x6	36x5	36x5d	W
*Thomart.....	1¼	1795	4 x5¼	34x5	34x5	(
Tiffin.....GW	1½	2100	4½x5¼	36x3½	36x5	W
Tiffin.....MW	2½	2700	4½x5¼	36x4	36x3½d	W
Tiffin.....PW	3½	3600a	4½x5½	36x5	40x5d	W
Tiffin.....PW	5	4300	4¾x6	36x6	40x6d	W
Tiffin.....UW	6	4500	4¾x6	36x6	40x12	W
Titan.....	2	2750	4 x5	36x4k	36x7k	D
Titan.....	2½	2950	4¼x5½	36x4k	36x8k	D
Titan.....	3½	3950	4½x6	36x5k	40x10k	D
Titan.....	5	4550	4½x6	36x5	40x12	D
Tower.....J	1½	2000	4½x5½	35x5n	38x7n	W
Tower.....H	2½	2475	4½x5¼	36x4	36x7	W
Tower.....G	3½	3475	4½x5½	36x5	36x5d	W
Traffic.....	1½	1595a	3¾x5	35x5n	35x5n	I
Traffic.....C	2	1595a	3¾x5	34x3½k	34x5k	I
Traffic.....	3	1895a	3¾x5	36x4	36x7	I
*Transport.....15	1	1295	3¾x5	32x4½n	32x4½n	B
Transport.....25	1½	1495	3¾x5½	34x3½k	34x4k	I
Transport.....35	2	1885a	3¾x5	36x3½k	36x6k	I
Transport.....55	3	2385	4½x5¼	36x4k	36x8k	I
Transport.....60	3½	2585	4½x5½	36x4k	36x8k	I
Transport.....75	5	3485	4½x6	36x5k	36x12k	I
Traylor.....B	1½	2390	3¾x5½	34x3½	34x5	W
Traylor.....C	2-2½	2850	4 x5½	36x4	36x7	W
Traylor.....D	3-3½	3300	4½x5½	36x4	36x8k	W
Traylor.....F	5-6	4700	4½x6	36x6	40x6d	W
*Triangle.....AA	1	1285	3½x5	34x4½n	34x4½n	I
Triangle.....A	1½-2	1985	3¾x5¼	34x3½k	34x6k	I
Triangle.....C	2-2½	2285	3¾x5½	36x4k	36x7k	I
Triangle.....B	2½-3	2585	4 x5¾	36x4k	36x7k	I
Twin City...B.W.	2	2750	4 x5½	36x6	40x8	I
Twin City...AW.	3½	3950	4½x6	36x5	40x5d	W
*Twin City.....B	3½	....	5½x6	36x6	36x6	I
*Twin City.....A	5	....	5½x6	36x7	36x7	I
Ultimate.....A	2	3150	4 x5½	36x3½	36x6	W
Ultimate.....AJ	2	3200	4½x5½	36x3½	36x6	W
Ultimate.....AJL	2	3250	4½x5½	36x3½	36x6	W
Ultimate.....B	3	3700	4½x5½	36x4	36x4d	W
Ultimate.....BL	3	3800	4½x5½	36x4	36x4d	W
Ultimate.....D	5	5500	5 x6½	36x6	40x12	W
United.....A	1½	2145	3¾x5¼	34x3½k	34x5k	W
United.....B	2½	3150	4¼x5½	36x4k	36x7k	W
United.....C	3½	3975	4½x5½	36x5	36x5d	W
United.....V	5	4500	4½x6	36x6	40x6d	W
*United States..U	1¼	1800	3⅝x5½	34x5n	34x5n	B
UnitedStates,NW	1½-2	2375	3¾x5	36x5	36x3½	W
United States...N	1½-2	2175	3¾x5	36x3½k	36x5k	I
United States...R	3	3300	4 x5¼	36x4	36x4d	W
United States...S	4	4075	4½x5½	36x5	36x5d	W
United States...T	5-7	4975	4¾x6½	36x6	40x6d	W
Velie.....46	1½	1585	3¾x5	36x3½k	36x5k	I
Veteran.....M**	1½	2699	3¾x5¼	35x5n	35x5n	W
Veteran.....P**	2	3699	4¼x5½	36x4	36x7	W
Veteran.....R**	3	4200	4¼x5½	36x4	36x7	W
Veteran.....S**	4	5395	4½x6	36x5	36x10	W
*Vim.....29	½	1050	3½x4½	31x4n	31x4n	W

3—Moreland Road Runner. 4—Nelson Le Moon. 5—Twin City Four Wheel Drive.

Specifications of Current Motor Truck Models—Continued

NAME AND MODEL	Tons Capacity	Chassis Price	Bore and Stroke	TIRES Front	TIRES Rear	Final Drive
Vim.....30	1½	$1175	3½x4½	32x4½	32x4½	W
*Vim.....50	½-¾	995	4 x5	32x4n	32x4n	B
Vim.....31	1	1975	3¼x5⅛	35x5n	35x5n	W
Vim.....22	2	3150	3¼x5⅛	36x4	36x6	W
Vim.....23	3	3950	4¼x5½	36x5	36x5d	W
Walker-JohnsonA	2	2250	3¼x5	34x3½	34x6	W
Walker-JohnsonB	3	2750	4¼x5½	36x4	36x8	W
Walter.....M	2½	3850	4½x5¾	36x4	36x8	D
Walter.....S	5	4850	4½x6¼	36x6	40x6d	W
*Watson.....C	1	1465a	3⅝x5⅛	35x5n	35x5n	W
Watson.....N	3½	4250	4½x5½	36x5	36x10	W
Western....W1½	1½	2550	4⅛x5¼	36x3½k	36x5k	W
Western....L1½	1½	2550	3¼x5	36x3½k	36x5k	W
Western....W2½	2½	3250	4⅛x5¼	36x4	36x7	W
Western....L2½	2½	3250	4¼x6	36x4	36x7	W
Western....W3½	3½	4250	4½x6	36x5	40x5d	W
*White.....15	¾	2400	3¾x5⅛	34x5n	34x5n	B
White.....20	2	$3250	3¾x5½	36x4k	36x7k	D
White.....40	3½	4200	3¾x5¾	36x5	40x5d	D
White.....45	5	4500	4¼x5¾	36x6	40x6d	D
White Hick.....E	1	1225	3¼x5	31x5n	34x5n	W
White Hick....H	1½	1375	3¼x5	36x3½	36x5	W
White Hick....k	2½	1675	4⅛x5¼	36x4	36x5	W
Wichita.....K	2	1875	3¼x5¼	36x3½	36x4k	W
Wichita.....M	1	2400	3¼x5¼	36x3½k	36x6k	W
Wichita.....RX	3	3200	4⅜x5¾	36x4k	36x8k	W
Wichita.....O	4	$3500	4½x6¼	36x5k	36x5k	W
Wilcox.....AA	1	1900	3¾x5½	36x4k	36x4k	W
Wilcox.....BB	1½	2550	4¼x5	36x4	36x5	W
Wilcox.....D	2½	3000	4¼x5	36x4k	36x3½dk	W
Wilcox.....E	3½	3950	4½x6	36x5k	36x5dk	W
Wilcox.....F	5	4350	4¾x6½	36x5	40x6d	W
Wilson.....F	1½	2270	3¾x5	36x3½	36x5	W
Wilson.....EA	2½	2825	4⅛x5¼	36x4	36x7	W
Wilson.....G	3½	3685	4½x5½	36x5	36x5	W
Wilson.....H	5	4520	4¾x6	36x6	40x6	W
*Wisconsin.....A	1	1750	3¾x5	34x5n	34x5n	W,B
Wisconsin.....B	1½	2100	3¾x5	35x5	36x6	W
Wisconsin.....C	2½	2700	4 x5¾	36x6n	36x7	W
Wisconsin.....D	3½	3000	4⅜x5¾	36x6n	40x8	W
Wisconsin.....E	5	3500	4½x6¼	36x6	36x10	W
Wisconsin.....F	7	4000	5 x6¼	36x6	36x12	W
Witt-Will.....N	1½	2450	3¾x5	36x3½k	36x5k	W
Witt-Will.....P	2½	2900	4½x5¼	36x3½k	36x7k	W

FINAL DRIVE:—B—Bevel, C—Chain, D—Double Reduction, I—Internal Gear, W—Worm.
r—8 cyl. s—6 cyl. t—2 cyl.—all others are 4 cyl. d—dual tires. k—pneumatic tires optional at extra cost. n—pneumatic tires. a—price includes several items of equipment, b—price includes body. *—express truck or delivery wagon. **—Canadian Make. trac—tractor.

Specifications of Current Farm Tractor Models

TRADE NAME	Rating	Price	Wheels or Crawlers	Engine	Cylinders: Bore, Stroke	Fuel	Plow Capacity
Allis-Chal.G.P	6-12	$250	2	LeR.	4-3½x4½	Gas.	1
Allis-Chalm...	15-25	1185	4	Midw	4-4½x5¼	Gas.	3
Allis-Chalm...	20-35	1885	4	Own	4-4¾x6½	GorK	3-4
‡Allis-Chalm.	20-35	2085	4	Own	4-4¾x6½	G	4
Allwork...2-G	14-28	1595	4	Own	4-4¾x6	GorK	3
Allwork.....C	14-28	1395	4	Own	4-5 x6	GorK	3
¶ARO.1921-22	3-6	385	4	Own	1-4½x5	Gas.	1
Aultman-T....	15-30	1900	4	Clim.	4-5 x6½	G,K	4
Aultman-T....	22-45	2810	4	Own	4-5½x8	G,K	6
Aultman-T....	30-60	4010	4	Own	4-7 x9	G,K,D	9-10
Automot. H-3	12-24	1250	4	Herc.	4-4 x5½	Gas.	2-3
Avery,SR.Cul.	5-10	....	4	Own	4-3 x4	G,K	..
Avery..Cult-C	....	....	3	Own	6-3 x4	G,K	..
Avery.....B	5-10	....	4	Own	4-3 x4	G,K	2
Avery.....C	....	....	4	Own	6-3 x4	G,K	..
Avery.....	8-16	....	4	Own	2-5½x6	G,K,D	2-3
Avery.....	12-20	....	4	Own	4-4½x6	G,K,D	3-4
§Avery.....	....	....	*	Own	4-4x5½	G,K,D	3
Avery.....	12-25	....	4	Own	2-6½x7	G,K,D	3-4
Avery.....	14-28	....	4	Own	4-5½	G,K,D	3-4
Avery.....	18-30	....	4	Own	4-5½x6	G,K,D	4-5
Avery.....	25-50	....	4	Own	4-6½x7	G,K,D	5-6
Avery.....	45-65	....	4	Own	4-7¾x8	G,K,D	8-10
Bates Mule.H	15-25	....	4	Midw	4-4½x5½	Gas.	3
Bates Mule. F	18-25	....	*2	Midw	4-4½x5½	Gas.	3
‡Bates MuleG	25-35	....	*2	Midw	4-4½x6	Gas.	..
Bear.....	25-35	4250	*2	Ste.	4-4¾x6½	Gas.	4
¶Beeman...G	2-4	240	4	Own	1-3½x4½	Gas.	....
Best.....	30	....	*2	Own	4-4¾x6½	G,K,D	4
Best.....	60	....	*2	Own	4-6½x8½	G,K,D	8-9
††Bolens.....	....	....	4	B & S.	1-2½x2½	G.	..
Boring.....	5-10	395	4	LeR.	4-3½x4½	G	..
Boring...1921	....	1850	3	Wauk	4-4¾x5¾	GorK	2
**Bryan.....	15-30	....	4	Own	2-4 x5	K.	3
Capital.....	15-30	1000	2	Own	4-4¾x6	Gas.	3
Case.....	12-20	1050	4	Own	4-4½x5	G,K,D	3
Case.....	12-20	....	....	....	4-4½x5	....	2
Case.....	15-27	1320	4	Own	4-4½x6	G,K,D	3-4
Case.....	22-40	2550	4	Own	4-5½x6¾	G,K,D	4-5
Case.....	40-72	5200	4	Own	7 x8	G,K,D	8-10
Caterpillar T35	15	....	*2	Own	4-4 x5½	Gas.	3
Caterpillar .5T	25	....	*2	Own	4-4¾x6	Gas.	4
Caterpillar 10T	40	....	*2	Own	4-6½x7	Gas.	6
Centaur.....	5-21½	315	2	N Way	2-4½x4½	GorK	1
Chicago....49	40	2500	4	Own	4-4½x6	Gas.	4
Cletrac.....F	9-16	595	*2	Own	4-3¼x4½	G,K,D	2
Cletrac.....W	12-20	1345	*2	Own	4-4 x5½	G,K,D	2-3
Dakota.....4	15-27	1500	3	Dom,	4-4¾x6	Gas.	3
Depue.....A	20-30	2500	4	Buda	4-4½x6	Gas.	3
Dill.....D	20	2380	4	Cont.	4-4½x5½	Gas.	3
Dill.....R.W.	20	2980	4	Midw.	4-4½x6	Gas.	3
De-it-All....A	3-6	495	..	Own	1-4½x5	Gas.	1
Eagle.....F	12-22	....	4	Own	2-7 x8	GorK	3-4
Eagle.....H	16-30	....	4	Own	2-8 x8	G or K	4-5
E-B.....AA	12-20	1095	4	Own	4-4¾x5	G,K,D	3
Fageol.....D	9-18	1525	4	Lyc.	4-3½x5	Gas.	2
Farm Horse.B	18-30	1885	4	Clim.	4-5 x6½	G,K	4
Farquhar....	15-25	....	4	Buda	4-4½x6	G,K,D	3-4
Farquhar....	18-35	....	4	Own	4-6 x8	G,K,D	4-5
Farquhar....	25-50	....	4	Own	4-7 x8	G,K,D	6-7
Fitch..4 Drive	20-35	1950	4	Clim.	4-5 x6½	GorK	3-4
Fordson.....	-18	$ 395	4	Own	4-4x5	G,K	2
Franklin....G	13-30	4000	*2	Clim.	4-5 x6½	G or K	3-4
Franklin....C	18-30	3350	*2	Clim.	4-5 x6½	G or K	3-4
Franklin...G2	18-30	4350	2	Clim.	4-5 x6½	G or K	3-4
Frick.....A	12-20	....	4	Erd.	4-4 x6	G,K	2-3
Frick.....C	15-28	....	4	Beav.	4-4¾x6	G,K	3-4
Grain Belt,..A	18-36	2150	4	Wauk	4-4¾x6¾	G or K	4
Gray.....	20-36	1975	3	Wauk.	4-4½x5¾	Gas.	4
Gray.....	22-44	2165	3	Wauk.	4-5 x6¾	Gas.	4-5
Gt. Western St	20-30	1950	4	Beav.	4-4¾x6	K	4
Hart-Parr..20	20	815	4	Own	2-5¼x6½	K,D.	2
Hart-Parr..30	30	1065	4	Own	2-6½x7	K,D.	3
‡Hart-Parr....	....	1695	4	Own	6½x7	K,D.	..
Heider.....D	9-16	870	4	Wauk	4-4¼x5¾	G,K	2
Heider.....C	12-20	995	4	Wauk	4-4½x6¾	G,K	3
Heider...Cult	5-10	800	4	LeR.	4-3½x4½	Gas.	1
Huber Light 4.	12-25	935	4	Wauk	4-4½x5¾	G or K	3
Huber Super 4	15-30	1895	4	Midw.	4-4½x6	Gas	3
Illinois,.....C	15-30	....	4	Clim.	4-5 x6½	G,K	4
Indiana.....F	5-10	665	2	LeR.	4-3½x4½	Gas.	1-2
International .	8-16	†670	4	Own	4-4¼x5	G,K,D	2
Internatl.Titan	10-20	†700	4	Own	2-6½x8	G,K,D	3
International..	15-30	1750	4	Own	4-5¼x8	G,K,D	4
J-T.....N	25-40	3000	*2	Clim.	4-5x6½	G,K,D	3-4
¶Kinkade....	1½	190	1	Own	1-3 x3	Gas.	....
La Crosse.....	12-24	985	2	Own	2-6 x7	G,K	3
Lauson.....5	12-25	1295	4	Midw.	4-4½x5¼	Gas.	3
Lauson.....21	15-30	1675	4	Beav.	4-4¾x6	G or K	3-4
‡Lauson Road	15-30	2000	4	Beav.	4-4¾x6	K	....
Leader.....B	12-18	685	4	Own	2-6 x6¼	G,K,D	2-3
Leader.....N	16-32	1725	4	Clim.	4-5 x6½	G,K	3-4
‡Leader...GU	18-35	2150	*2	Clim.	4-5 x6½	G,K	3-4
Linn.....HJJ	40-	4500	*	Cont.	4-4½x5½	Gas	4
Linn.....W	60	5000	*	Wauk	4-5 x6¼	Gas	6
Little Giant..B	16-22	2200	4	Own	4-4½x5	K	4
Little Giant..A	26-35	3300	4	Own	4-5½x6	K	6
Lombard.1922	35-150	8950	*2	Wisc.	6-5½x6¾	Gas.	16
Lombard.1922	50	5300	*2	Wisc.	4-4¾x6½	Gas.	6-10
MerryGar1922	2	210	2	Evin	1-2⅝x2½	Gas.	..
Minne...All-P	12-25	800	4	Own	4-4½x7	G or K	3
Minne. Gen.P	17-30	1600	4	Own	4-4¾x7	G or K	3-4
Minne. Med.D	22-44	2650	4	Own	4-6 x7	G or K	5-6
MinneHeavyD	35-70	3850	4	Own	4-7½x9	G or K	8-9
Mohawk .1922	8-16	650	2	Light	4-3½x4½	K or G	1-2
Moline Univ D	9-18	650	2	Own	4-3½x5	Gas.	2-3
Moline Orch..	9-18	....	2	Own	4-3½x5	Gas.	2-3
‡Monarch....	20-30	3500	*2	Beav.	4-4¾x6	G,K,D	4
Motor Maculi.	1½	195	2	Own	1-2¾x3½	Gas.	..
NB.....1	3-6	425	4	Own	2-3¾x4	Gas.	1
Nichols-Shep.	20-42	2650	4	Own	8 x10	G or K	3-6
Nichols Shep.	25-50	3000	4	Own	9 x12	G or K	4-7
Nichols-Shep.	35-70	3650	4	Own	10½x14	G or K	8-10
Nilson Senior..	20-40	1975	5	Wauk	4-5 x6¼	G,K	4
Oil Pull.....K	12-20	....	4	Own	2-6 x8	K,D	3
Oil Pull.....H	16-30	....	4	Own	2-7 x8½	K,D	4
Oil Pull ....G	20-40	....	4	Own	2-8 x10	K,D	5-6
Oil Pull.....E	30-60	....	4	Own	2-10x12	K,D	8-10
¶Oldsmar ..K	2½-5	$225	4	Own	1-5½x5½	Gas.	1
Peoria.....L	12-25	1600	4	Clim.	4-5 x6½	G,K	3
Pioneer.....G	18-36	1750	4	Own	4-5½x6	G,K,D	4
Pioneer.....C	40-75	3550	4	Own	4-7 x8	Gas.	10
Plowman....A	15-30	1295	4	Buda	4-4½x6	G,K	3-4
Reliable.....	10-20	390	4	Own	2-6 x7	Ker.	2
Rex.....	12-25	1600	4	Wauk	4-4¼x5¾	G or K	3
Russell.....	12-21	1500	4	Own	4-4¼x5¾	G or K	2-3
Russell.....	15-30	2200	4	Own	4-5 x6½	G or K	3-4
Russell.....	20-35	3000	4	Own	4-5½x7	G or K	4-5
Russell.....	30-60	5000	4	Own	4-8 x10	G or K	8-10
Samson....M	....	445	4	Own	4-4 x5½	G,K	2
Sandusky,...J	10-20	1250	4	Own	4-4¼x5¼	G,K,D	2
Sandusky...E	15-35	1750	4	Own	4-5 x6½	G,K,D	4
¶Shelby.....	1	150	3	B & S	1-2½x2½	G	..
Shelby.....D	15-30	....	4	Beav.	4-4¾x6	G,K	3
Shelby.....C	9-18	....	4	Wauk	4-3¾x5¼	G or K	2
Steady Pull ..	12-24	1485	4	Own	4-4 x5	Gas.	3
Tioga.....3	18-32	....	4	Wisc.	4-4½x6	Gas.	3-4
Toro Cultivator	6	750	3	LeR	4-3½x4½	Gas.	2
ToroTractor'22	6-10	495	3	LeR	4-3½x4½	Gas.	2
Townsend....	10-20	800	2	Own	4-6½x7	Ker.	2-3
Townsend....	15-30	1350	2	Own	4-7 x8	Ker.	3-4
Townsend....	25-50	2500	2	Own	4-8½x10	Ker.	4-8
Traction Motor	40-50	....	4	....	8-3½x5	Gas.	4-5
Traylor....TB	6-12	500	4	LeR.	4-3½x4½	Gas.	1-2
Trundaar...10	25-40	3750	*2	Wauk	4-5 x6¼	G or K	4
Twin City....	12-20	1200	4	Own	4-4¼x6	G,K	3
Twin City....	20-35	2750	4	Own	4-5½x6¾	G,K	5-6
Twin City....	40-65	4750	4	Own	4-7¾x9	G,K	8-10
Uncle Sam C20	12-20	1295	4	Weid.	4-4 x5½	G	2-3
Uncle Sam B19	20-30	1985	4	Beav.	4-4¾x6	G or K	3-4
Uncle Sam D21	20-30	1895	4	Beav.	4-4¾x6	G or K	3-4
Utilitor....501	2¼-4	295	4	Own	1-3½x4½	G	1
Utilitor...501A	2¼-4	340	4	Own	1-3½x4½	G	1
Wallis.....K	15-25	....	4	Own	4-4¼x5¾	G,K	3
Waterloo...N	12-25	675	4	Own	2-6½x7	Ker.	3
Wetmore21-22	12-25	1185	4	Wauk	4-4 x5¾	G,K	3
Whitney....D	9-18	595	4	Own	2-5½x6½	Gas.	2
Wichita.....T	15-30	2000	4	Beav.	4-4½x6	G,K,D	3-4
Wisconsin...E	16-30	1850	4	Clim.	4-5 x6½	G or K	3
Wisconsin...F	20-40	2050	4	Wauk	4-5 x6¼	G or K	4
Wisconsin...H	22-40	2550	4	Clim.	4-5½x7	G or K	4-6
Yuba....12-20	12-20	2400	*2	Wisc.	4-4½x6¾	G,K,D	3
Yuba....15-25	15-25	2750	*2	Wisc.	4-4½x6	G,K,D	..
Yuba....20-35	20-35	3900	*2	Wisc.	4-5¾x7	G,K,D	4
Yuba....25-40	25-40	4250	*2	Wisc.	4-5¾x7	G,K,D	..
‡Yuba.....	25-40	4750	*2	Yuba	4-5¼x7	D	..
Zelle.....	12-25	....	4	Buda	4-4¼x5½	G or K	3

ABBREVIATIONS: G—Gasoline. K—Kerosene. D—Distillate. Plow capacity varies in relation to operating conditions. Figures are based on 14 in. plows. Engine Make: Beav. —Beaver. B & S—Briggs & Stratton. Clim.—Climax. Cont. —Continental. Dom.—Domas Evin.—Evinrude. Herc.—Hercules. LeR.—LeRoy. Midw.—Midwest. Nway.—New Way. Nor.—Northway. Ste.—Stearns. Wauk.—Waukesha. Weid.—Weidely. Wis.—Wisconsin. *—Crawler type. All others are wheel type. †Price includes plows §Track Runner. ‡Industrial Tractor. ¶Garden Tractor. **Steam Tractor ††—Power Hoe.

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Detroit, - Michigan

Specifications of Current Passenger Car Models

NAME AND MODEL	Engine Make	Cylinders Bore and Stroke	WB	Tires	2-Pass.	5-Pass.	7-Pass.	Coupe	Sedan
Ambassador.....R	Cont..	6-3⅝x5¼	136	33x5	....	b4500	$4500	....	$6500
American.....D-66	H-S...	6-3½x5	127	33x4½	b1885	1785 b1850n	1850	....	2485
Anderson...Aluminum 6	Cont..	6-3⅛x4¼	114	32x4	....	1195	....	....	....
Anderson.....Series 40	Cont..	6-3¼x4½	120	33x4	1495	1495 b1595n	1595	$1995	1995
Apperson.....8-21-S	Own..	8-3¼x5	130	34x4½	....	2620	2645	3625	3695
Auburn.....6-51	Cont..	6-3⅜x4½	121	32x4	1575	1475	....	2275	2345
Auburn.....6-51	Cont..	6-3⅜x4½	121	32x4½	....	n1995	1545	....	....
Bay State.....	Cont..	6-3¼x4½	121	32x4	1800	1800	....	2400	2500
Biddle.....B1 & B5	Buda..	4-3¾x5⅛	121	32x4	2950	b2950	....	3950	3950
Brewster.....91	Own..	4-4 x5½	125	32x4½	5000	5000	....	....	7000
Buick...1922-34-5-6-7-38	Own..	4-3⅜x4¾	109	31x4	865	885	u 725	1175	1395 1325c
Buick....1922-41-4-5-47	Own..	6-3⅜x4½	118	33x4t	1175	1195	u975	1935c	1935
Buick.1922-48-9-50-4-55	Own..	6-3⅜x4½	124	34x4½	n1625v	n1675v	1435	1895	2195
Cadillac.....61	Own..	8-3½x5½	132	33x5	3100	3150	3150	b3875	4100
Case.....X	Cont..	6-3⅜x4½	122	32x4½	1750	1790	....	2550	2690
Case.....W	Cont..	6-3½x5¼	129	34x4½	....	2200	2250	2850	3250
Chalmers.....1922	Own..	6-3¼x4½	117	32x4	1185	1185	....	1595	2295
Chalmers.....1922	Own..	6-3¼x4½	122	32x4	....	....	1345	....	....
Chandler.....Six	Own..	6-3½x5	123	33x4	1495	b1495	1615	b1995	2295
Chevrolet.....Superior	Own..	4-3⅛x4	102	30x3½	510	525	u425	b810 k680	860
Chevrolet.....FB	Own..	4-3⅛x5¼	110	33x4	865	885	....	1325	1395
Cleveland.....41	Own..	6-3 x4½	112	32x4	1085	1095	n1260	1495	1535
Cole.....8J	Nort..	8-3½x4½	127¼	33x5	2685	b2685n	2685	b3385	3685
Columbia.....De Luxe	Cont..	6-3⅛x1¼	115	32x4	1475	1475	b1475n	b1925	1995
Columbia.....Light Six	Cont..	6-3⅛x1¼	115	31x4	995	985	....	....	1395
Comet.....C-53	Cont..	6-3½x5¼	125	33x4½	....	1985	2085	....	2985
Courier.....	Own..	6-3½x4½	116	32x4	a1395 a1495n	1395	b1495n	2065	2165
Crawford.....22-6-60	Cont..	6-3⅝x5¼	122½	32x4	3000	3000	3000	....	4500
Crawford-Dagner...6-60	Cont..	6-3⅝x5¼	135	33x5	....	n3500	....	....	....
Daniels.....D-10	Own..	8-3½x5¼	132	33x5	a4350	b4350	4350	5250	6000
Davis.....71	Cont..	6-3⅛x1¼	115	31x4	....	1295	....	1795	1795
Davis.....61-67	Cont..	6-3⅜x4½	120	32x4	1595	1595	b1695	2095	2195
Dixie Flyer.....H-S-70	H-S...	4-3½x5	112	32x4	1175	1175	b1295	1515	1595
Dodge Brothers.....	Own..	4-3⅞x4½	114	32x4	850	880	....	980b	1440 1195h
Dorris.....6-80	Own..	6-4 x5	132	33x5	....	b3350	3950	4985b	5750
Dort.....10-11	D-Ly..	4-3½x5	108	31x4	885	855	....	1265 1075k	1385 1095k
Driggs.....	Own..	4-2⅝x4½	104	30x3½	1275	1275	....	1650	1975
Duesenberg...Straight 8	Own..	8-2½x5	134	33x5	6500	6500	6750	7800	7800
Du Pont.....A	Own..	4-3⅛x5½	124	32x4½	3000	3200	....	3800	4000
Durant.....A-22	Cont..	4-3⅛x1¼	109	31x4	n890	890	....	1365	1365
Durant.....B-22	Anst..	6-3¼x4½	123½	32x4½	1600	1650	....	2250	2400
Earl.....49	Own..	4-3 x5¼	112	32x4	1485	1035	950u	b1395	1795
Elcar.....K-4	Lyc...	4-3½x5	118	33x4	1095	1095	n1095	1315	....
Elcar.....7-R	Cont..	6-3¼x4½	118	33x4	1335	1335	n1395	2035	2165
Elgin.....K-1	Falls..	6-3⅛x1¼	118	33x4	1345	1295	b1345	1695	1635
Essex.....	Own..	4-3⅝x5	108½	32x4	....	1045	....	1145k	1895 1245k
Ford.....T	Own..	4-3¾x4	100	30x3½	r319	s348	u285	580	645
Fox.....	Own..	6-3⅜x5	132	32x4½	3900	3300	....	4900	4900
Franklin.....10-A	Own..	6-3¼x4	115	32x4	1900	1950	u1750	2100 2750	2250 2850
Gardner.....T-R & G	Lyc...	4-3½x5	112	32x4	895	895	....	1095k	1345
Grant.....	Walk'r	6-3½x4½	116	32x4	1385	1385	....	1895	1945
Gray.....	Own..	4-3⅝x4	100	30x3½	....	490	....	....	760
H.C.S.....Series 3	Weid..	4-3⅝x5½	120	32x4½	2475	2475	....	3250	3475
Handley-Knight.....	Own..	4-4½x4½	125	32x4½	....	....	2650	3150	3450
Hanson.....30	Cont..	6-3½x1¼	114	31x4	....	995	....	....	....
Hanson Six.....60	Cont..	6-3⅜x4½	121	32x4	1595	1595	1795	b2275	2585
Hatfield.....A-42	H-S...	4-3½x5	115	32x4	....	1315	b1345	1950	1950
Haynes.....75	Own..	6-3½x5..	132	34x4½	2395	b2395	2395	....	3395
Haynes.....55	Own..	6-3½x5	121	32x4½	1545 1895n	1495 1895n	....	2035 2195n	2395 2695n
Holmes.....Series 4	Own..	6-3½x1¼	126	34x4½	....	b2500	2500	b3300	3600
Hudson.....Super 6	Own..	6-3½x5	126	34x4½	....	b1525	1575	2570	2295 1625k
Huffman.....	Cont..	6-3⅜x4½	120	32x4	1395	1395	....	....	2295
Hupmobile.....Series R	Own..	4-3¼x5½	112	32x4	1150	1150	u1025	1635 1335k	1785
Jackson.....63S	Cont..	6-3¼x4½	121	32x4½	....	1485	b1685	2985	2985
Jewett.....Six	Own..	6-3⅛x5	112	31x4	a995	995	....	b1445	1465
Jordan.....MX	Own..	6-3⅞x4¾	120	32x4	1895	1795	....	2435	2485
Jordan.....	Own..	6-3⅞x4¾	124½	32x4	....	b2150n	....	....	....
Kelsey.....4	Gray..	4-3½x5	111	32x3½	....	985	....	....	1450
Kelsey.....6	Walk'r	6-3½x4½	118	32x4	....	1525	....	....	2175
Kenworthy.....8-90	Own..	8-3 x5¼	130	32x4½	5000	5000	5250	6000	6000
King.....K	Own..	8-3 x5	120	32x4½	1795	1795	b1795	2400	2550
Kissel.....45	Own..	6-3⅞x5½	124	32x4½	n2385	1885	2385	b2975	3075
Kline Kar.....6-55-K	Cont..	6-3⅝x4½	121	33x4	1690	1690	1690	2750	2890
LaFayette.....	Own..	8-3¼x5¼	132	33x5	3985	b4090	4090	5500	5500
Leach.....999	Own..	6-3⅜x5¼	134	32x4½	5500	5500	5500	5500	5500
Lexington.....23	Anst..	6-3¼x4½	123	32x4½	1695	1695 2045n	1795	b2345	2545
Liberty.....10-D	Own..	6-3½x5	117	32x4	1575	1395	1575n	2085 1695k	2245

NAME AND MODEL	Engine Make	Cylinders Bore and Stroke	WB	Tires	2-Pass.	5-Pass.	7-Pass.	Coupe	Sedan
Lincoln.....	Own..	8-3⅜x5	136	33x5	$3800	b3800	$3800	$4400	$4700
Locomobile.....48	Own..	6-4½x5½	142	35x5	....	b7600	7600	10500	11000
Marmon.....34	Own..	6-3¾x5½	136	32x4½	3385	b3185	3185	3985	4385
Maxwell.....	Own..	4-3⅝x4½	109	31x4	885	885	....	1235	1335
McFarlan.....1922	Own..	6-4½x6	140	33x5	6300	b6300	6300	7500	7500
Mercer.....Series 5	Own..	4-3¾x6⅜	132	32x4½	3950	b3950	c3950	4850	5250
Merit.....	Cont..	6-3¼x4½	119	32x4	1895	1895	....	....	....
Mitchell.....F-50	Own..	6-3½x5	120	32x4	a1490	1590	b1850	b2050	2275
Mitchell.....F-50	Own..	6-3½x5	127	32x4½	....	....	1690	....	....
Monroe.....1922-S-9	Own..	4-3¼x4½	115	32x3½	950	950	....	....	....
Moon.....6-40	Cont..	6-3⅛x1¼	115	31x4	....	1295	....	....	1695
Moon.....6-58	Cont..	6-3⅜x4½	128	33x4½	1785	1785	1785	2785	2785
Nash.....691-96-97	Own..	6-3¼x5	121	33x4	1210	1240	b1395n	....	2040
Nash.....692-94-95	Own..	6-3¼x5	127	34x4½	....	....	1390	b1890	2190
Nash Four.....41-4	Own..	4-3⅝x5	112	33x4	915	935	....	a1385 1195k	1545 1275k
National.....BB	Own..	6-3½x5¼	130	32x4½	a2475	b2475	2375	b3725	3825
Noma.....3C	Cont..	6-3¼x4½	128	32x4½	2500	b2500	c2600	....	3500
Noma.....1D	Bea...	6-3½x5¼	128	32x4½	3000	b3100	c3200	....	5500
Norwalk.....430-KS	Lyc...	4-3½x5	116	32x3½	....	1035	....	....	....
Oakland.....6-44	Own..	6-2¹¹⁄₁₆x4¾	115	32x4	975	995 u795	b1165n	b1445 1185k	1545
Ogren.....6 T D Luxe	Cont..	6-3⅝x5¼	134	33x5	b3750	3750	3850	4500	4800
Oldsmobile.....43 A	Own..	4-3¹¹⁄₁₆x5¼	115	32x4	995	975 1350	b1075n	1475	1595 1375
Oldsmobile.....46	Own..	8-2⅞x4¾	122	33x4½	b1735	c1850	1735	....	2635
Oldsmobile.....47	Own..	8-2⅞x4½	115	32x4	1 75	1495	b1675n	1875	2025
Overland.....4	Own..	4-3⅜x4	100	30x3½	525	525	425u	795	875
Packard.....Single-Six	Own..	6-3⅜x5	126	33x4½	2485	2485	u2250	3175	3275
Packard.....Single-Six	Own..	6-3⅜x5	133	33x4½	....	u2350	2685	....	3525
Packard.....Twin-Six	Own..	12-3 x5	136	33x5	3850	3850	3850	5240	5400
Paige.....6-44	Own..	6-3¼x5	119	32x4	1465	1165	u1290	1995	2245
Paige.....6-66	Cont..	6-3¾x5	131	33x4½	a2495	n2215	2195	3100	3155
Paterson.....22-6-52	Cont..	6-3⅜x4½	120	32x4½	....	1390	1425	2395	2395
Peerless.....56-S-7	Own..	8-3¼x5	128	33x5	....	b2900	2900	b3400	3900
Pierce-Arrow.....	Own..	6-4 x5½	138	33x5	5250	b5250	5250	6800	7000
Pilot.....6-50	H-S...	6-3¼x5	126	32x4½	2050	2000	2050	2950	3000
Premier.....6-D	Own..	6-3⅜x5½	126¾	33x5	3150	b3100	3250	4300	5100
Premocar.....6-40-A	Falls..	6-3¹¹⁄₁₆x1¼	117	32x4	1095	1095	....	1750	1825
R & V Knight.....R	Own..	4-3¾x5	116	32x4	....	1665	....	2385	2475
R & V Knight.....J	Own..	6-3½x4½	127	32x4½	2475	b2475	2475	3015	3105
Reo Series.....T6 & U6	Own..	6-3⅛x5	120	33x4	1595	n1645	1185	b2355	2435
ReVere.....C	Dues..	4-4¼x6	131	32x4½	3200	3200	3200	....	4000
Rickenbacker.....A	Own..	6-3½x4¾	117	32x4	....	1 85	....	1885	1985
Roamer.....6-54-E	Cont..	6-3½x5¼	128	32x4½	2635	b2 85 b2750	2685	a3785 35 5	3585 3950
Roamer.....4-75-E	Dues..	4-4¼x6	128	32x4½	3785	b3485	b3650n	....	b3650
Rolls-Royce.....	Own..	6-4½x4¾	143½	33x5	....	10,900	....	....	....
Saxon.....135	Own..	4-3½x5	112	32x4	1195	1195	....	1795	1795
Sayers Six.....DP	Cont..	6-3¼x4½	118	33x4	1645	1645	....	2645	2645
Seneca.....L-2 & O-2	Lyc...	4-3½x5	108	30x3½	875	875	....	....	....
Seneca.....50 & 51	Lyc...	4-3½x5	112	31x4	1095	1095	....	....	....
Sperling.....A	Supr..	4-3⅜x5	114	32x4	980	980	....	1685	1685
Standard.....98	Own..	8-3¼x5	127	34x4½	2150	b2395	2395	2750	3200
Stanley.....	Own..	2-4 x5	130	32x4½	2700	2700	2700	3775	3950
Stanwood Six.....	Cont..	6-3¼x4½	118	33x4	1765	1765	....	2750	....
Star.....	Cont..	4-3½x1¼	102	30x3½	r319	s348	u285	580	645
Stearns-Knight....SKL4	Own..	4-3¼x5⅝	125	31x4½	2250	2250	2450	3150	3450
Stearns-Knight.....6	Own..	6-3⅜x5	130	31x4½	2700	2700	2850	3350	3700
Stephens.....93	Own..	6-3¼x4½	122	33x4½	1575	b1595	c1625	2450	2550
Stevens-Duryea.....E	Own..	6-4½x5½	138	35x5	7250	b6900	6800	u5600	b8900
Studebaker....Light Six	Own..	6-3½x4½	112	32x4	975	975	u785	1225	1550
Studebaker..Special Six	Own..	6-3½x5	119	32x4	1250	1275	b1275	1875	2050
Studebaker.....Big Six	Own..	6-3⅞x5	126	33x4½	u1300	1650	n1785	2275	2475
Stutz.....	Own..	4-4¾x6	130	32x4½	2450 2760n	b2790	c2640	3490	4450
Templar.....A-445	Own..	4-3⅜x5½	118	32x4	2025	2125	b2175	2650	2785
Tulsa.....E-1-2-3	H-S...	4-3½x5	117	33x4	1175	1175	....	....	....
Velie.....58	Own..	6-3½x4¼	115	32x4	1275	1275	....	1795	1795
Westcott.....C-48	Cont..	6-3½x5¼	125	32x4½	....	....	1890	....	2890
Westcott.....A-44	Cont..	6-3¼x4½	120	32x4	....	1690	a1890	....	2690
Wills Sainte Claire. A-68	Own..	8-3¼x4	121	32x4½	2475	2475	....	3275	3475
Willys-Knight.....20	Own..	4-3⅜x4½	118	32x4	1235 1135u	1235	1435	1795	1950 2195
Winton.....40	Own..	6-3¾x5¼	132	35x5	3400	n3600	3400	b4450	4550

a—3-passenger. b—4-passenger. c—6-passenger. n—Sport. h—All Metal Type. k—Soft Top Type. u—Chassis Price. r—Price without starter and demountable rims. Price with starter and demountable rims $414. s—Price without starter and demountable rims. Price with starter and demountable rims $443. t—Model 47—34x4½ Tires. v—Tire Sizes 32x4½. c—Touring Sedan.

Engine Make: Anst—Ansted. Bea—Beaver. Cont—Continental. Curt—Curtis. D.Ly—Dort Lycoming. G-R—Grey Beal. H-S—Herschell-Spillman. Lyc—Lycoming. Nort—Northway. Roch—Rochester. Rut—Rutenberg. Supr—Supreme. Weid—Weidely. Wisc—Wisconsin.

Price changes: Elcar 7 passenger coupe $1975, sedan $2605. Velie 58 coupe and sedan $1785.